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ANALYSIS DIRECTORY OF CANADIAN COMMERCIAL COALS - SUPPLEMENT NO. 4

D.K. FAURSCHOU, G.W. BONNELL AND L.C. JANKE

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ANALYSIS DIRECTORY OF CANADIAN COMMERCIAL COALS - SUPPLEMENT No. 4

by

D.K. Faurschou*, G.W. Bonnell** and L.C. Janke***

SUMMARY

The quality of Canadian commercial coals was monitored from 1978 to 1981 by independently sampling mine run and prepared coals at operating mines, preparation plants, thermal generating plants and delivery points on an occasional basis, usually annual, with the cooperation of the coal industry. Sampling and sample preparation were done by personnel of the Coal Research Laboratories located at Sydney, Nova Scotia and Edmonton, Alberta. Analyses, for the most part, were performed at the CANMET laboratories in Ottawa and Sydney.

Generally, the samples represent production on a specific day, thus the results are broadly indicative, at least for comparative and screening purposes, of the quality of Canadian commercial coals produced at the time of sampling. Also, because of financial and manpower limitations, not all sites were sampled. For example, in 1980 and 1981 Western Canadian coals were not sampled.

Coals are identified by operator (not necessarily the lease owner), name of mine, seam, coalfield and location. Information is arranged by province and is intended to provide a ready indication of the quality of commercially available coals and to complement coal industry statistics available in other federal and provincial reports.

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RÉPERTOIRE DES ANALYSES DES CHARBONS COMMERCIAUX CANADIENS
SUPPLÉMENT No. 4

par

D.K. Faurschou*, G.W. Bonnell** and L.C. Janke***

SOMMAIRE

De 1978 à 1981, on a examiné la qualité des charbons commerciaux canadiens par divers moyens, dont l'étude indépendante d'échantillons de produits bruts, de charbons préparés dans des mines en opération, dans des installations de préparation, des installations thermiques, de même qu'à l'occasion - généralement sur une base annuelle - à des points de livraison, et ce avec la collaboration de l'industrie du charbon.

L'échantillonnage et la préparation des échantillons a été effectuée par le personnel des Laboratoires de recherche sur le charbon, situés à Sydney, en Nouvelle-Ecosse, et à Edmonton, en Alberta. La plupart des analyses ont été faites aux laboratoires de CANMET à Ottawa et à Sydney.

En général, les échantillons représentant la production au cours d'une journée spécifique, les résultats offrent un vaste éventail, du moins à des fins de comparaison et de triage, de la qualité des charbons commerciaux canadiens produits lors de l'échantillonnage. Nous devons signaler qu'à cause de limitations financières et de main-d'oeuvre, tous les sites n'ont pas été échantillonnés. Ainsi, les charbons de l'Ouest du Canada ne furent pas échantillonnés en 1980-1981.

On a identifié les charbons selon le nom de l'exploitant de la mine (lequel n'est pas nécessairement le même que celui du propriétaire du bail), de même que selon le filon, le bassin houiller et l'emplacement. L'information, disposée par province, vise à offrir une indication immédiate de la qualité des charbons commerciaux disponibles. En outre, elle a pour but de compléter les statistiques relatives à l'industrie du charbon qui sont disponibles dans d'autres rapports fédéraux et provinciaux.

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INTRODUCTION

Complete chemical and physical analytical services are provided by CANMET for departmental and other coal projects, with files dating back to 1910. Consequently, industry and other government departments make direct enquiries about the quality of Canadian coals. Most enquiries originate from current and prospective consumers who need information about the type of coal they use or who want to consider alternative sources of supply and from producers and prospective producers who wish to be informed about available products. As well, enquiries are received from various government departments requiring commercial coal quality information for inventroy and regulatory purposes.

To meet these needs, CANMET prepares the "Analysis directory of Canadian commercial coals" which has been updated at various intervals since its original issue in 1948 (1,2,3,4). This supplement covers analyses of coals sampled by CANMET staff in Nova Scotia, New Brunswick, Saskatchewan, Alberta and British Columbia from 1978 to 1981. However, financial and manpower limitations did not permit complete coverage of coal sampling sites in Western Canada in 1980 and 1981.

Individual data sheets for each sample provide a selection of chemical and physical characteristics and identify the samples with regard to their relevant coalfields, seams and mining districts. This information provides a better understanding of variations in coal quality within and between coalfields. The selected format makes it possible to relate this information to the statistical data and summaries of coal industry developments which appear in various publications (5,6) and in certain federal and provincial coal reports dealing with production statistics and resource and reserve assessment (7).

Future presentations of analytical data on commercial coal may involve further changes in format that will provide more information consistent with developing concepts and establishing a national coal inventory for Canada.

Sample collection and preparation were conducted by staff of the regional laboratories of CANMET's Coal Research Laboratories in Sydney, Nova Scotia and Edmonton, Alberta with the cooperation and assistance of mine operators and consumers. Normal mining and preparation plant procedures were followed so that the samples would be unbiased.

All samples were obtained in accordance with recognized techniques and were considered representative, in general, of production on the day of collection.

Sample preparation facilities of the New Brunswick Electric Power Commission were used for partial preparation of samples from the Minto coalfield in New Brunswick. Elsewhere, mobile and base facilities of the regional laboratories were used.

The analyses were conducted by qualified, experienced personnel at the Sydney and Ottawa laboratories using standard procedures of the American Society for Testing and Materials (ASTM). Although sampling procedures and analytical results of individual samples must be accorded a high degree of confidence, the frequency and timing of sampling and selection of samples from a variety of sources - seams, trucks, conveyors, mine sites, preparation plants and delivery points - mean that the data may only be subjected to statistical analyses with some reservations. It must be understood that individual sample results are not necessarily typical or representative of production over long periods and certainly should not be related to specific contract specification requirements. It is hoped that the chemical and physical information will be useful for purposes such as: considering quality aspects of contract specifications, classifying coal by rank, considering environmental hazards, selecting combustion or conversion processes and to a limited extent evaluating coal suitability for metallurgical use. The specific data and their usefulness are discussed briefly below.

The proximate analysis includes mass per cent of moisture, ash, volatile matter and fixed carbon. For anthracitic and low-, medium- and high-volatile A bituminous coals these determinations together with sulphur content and calorific value are presented on the basis of as-received moisture which is characteristically low; however, for high-volatile B and C bituminous, subbituminous and lignite coals, the proximate analysis, sulphur content and calorific value are presented on the basis of equilibrium moisture content.

The as-received moisture is the total of the moisture loss determined on air drying under standard conditions (adherent or surface moisture) and the residual moisture determined as part of the proximate analysis (inherent or oven dried moisture). On the other hand, the equilibrium moisture provides a means of estimating the natural bed moisture exclusive of surface moisture and is essential for classifying low-rank coals.

Data on proximate analysis, sulphur content and calorific value are essential for establihing contract specifications and prices and for quality control of coal deliveries. The moisture, ash, and sulphur contents and the calorific value are subject to improvement by appropriate coal preparation techniques used to upgrade the coal. The fixed carbon and volatile matter contents on a moisture, mineral-matter-free basis, along with the calorific value are essential for classifying coals by rank according to ASTM (Table 1).

The rank of the coal indicates the degree to which the original organic matter has been metamorphosed by temperature and pressure over time to form lignite, subbituminous, bituminous or anthracite coals. Rank is important commercially because within wide limits it signifies the potential use of the coal, subject to considerations related to quality factors such as moisture, ash, sulphur and trace element content.

The ultimate analysis presented on a dry basis includes mass per cent of carbon, hydrogen, sulphur, nitrogen, ash and oxygen, the latter obtained by difference from 100%. This elemental analysis is basic to the selection of coal for conversion and combustion.

The sulphur and trace mercury contents are important considerations related to power plant emissions and regional or national environmental pollution regulations. As well, sulphur is an unwanted constituent in the manufacture of coke for the metallurgical industry.

Sulphur forms reported in this publication are subdivided into three groups: pyritic sulphur, sulfate sulphur and organic sulphur. Sulphur forms are important considerations in coal washability and liquefaction.

Ash fusibility temperatures are determined in a reducing atmosphere and are considered when selecting combustion equipment to avoid or reduce clinkering and slagging problems.

The mineral content of ash is important in furnace design as well as in the design of electrostatic precipitators. Mineral analysis of coal ash together with ash fusibility temperatures allow the prediction of slag viscosity. Mineral analysis of coal ash can also be used to predict the nature of fireside deposits formed in the boiler and characteristics of the fly ash such as electrical resistivity.

The Hardgrove Grindability Index is an indicator of the energy required to grind a coal to the desired fineness; the lower the index the more energy required.

The ASTM Free Swelling Index (FSI) is an indicator of the swelling and caking characteristics of coal and is particularly relevant to selecting metallurgical coals.

The coal analyses are arranged by province. Each page contains a three-line heading stating where possible:

- name of mine operator (not necessarily the lease owner),
- number or name of mine, seam, and coalfield,
- mine location by place name and county or district as appropriate, and province.

For Alberta, the location is also identified by section, township, range and meridian according to the Alberta Land Survey System.

The approximate annual coal production of the major mines in Canada, in thousands of tonnes, is shown in Table 2 for 1978-1981. Statistics are arranged by province, coalfield and company.

A statistical summary of grouped data which is considered useful for an overall understanding of the quality and variability of Canadian commercial coals is presented in Table 3. This summary presents mean, standard deviation and standard error for the results of ash, sulphur and sulphur forms, where the number of samples permit.

CONVERSION FACTORS

The data in this report are given in the International System of Units (SI) where practicable. This represents a transition of units in the series of directory reports. Relevant conversion factors are tabulated below:

a) SI to conventional units

SI	x	Conversion factor	=	Conventional
°C	x	(1.8 x °C) + 32	=	°F
kg, kilogram	x	2.204 622 6	=	lb (avoirdupois)
t, tonne (1000 kg)	x	1.102 311	=	t, short ton (2000 lb)
t, tonne (2 204.622 6 lb)	x	0.984 206 5	=	t, long ton (2240 lb)
J, joule	x	0.000 947 8	=	Btu, British thermal units
MJ/kg, megajoule/ kilogram	x	429.923	=	Btu/lb

b) Conventional to SI units

Conventional	x	Conversion factor	=	SI
°F	x	5/9 (°F - 32)	=	°C
lb (avoirdupois)	x	0.453 592 3	=	kg, kilogram
t, short ton (2000 lb)	x	0.907 184 74	=	t, tonne (1000 kg)
t, long ton (2240 lb)	x	1.016 046 908 8	=	t, tonne (2 204.622 6 lb)
Btu, British thermal unit	x	1055.06	=	J, joule
Btu/lb	x	0.002 326	=	MJ/kg, megajoule/ kilogram

COAL ANALYSES - NOVA SCOTIA

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		3-5-78	19-9-78
Sampling location		Mine Loading Head	Seaboard Power Station
Product name		Course Slack	
Screen opening, mm		Minus 51, sq	
ERL number		2810-78	2809-78
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	7.42	6.94
Ash	%	9.59	12.00
Volatile matter	%	31.81	31.44
Fixed carbon	%	51.18	49.62
Sulphur, as rec'd	%	2.16	2.03
Calorific value, as rec'd:			
	MJ/kg	28.92	28.92
	Btu/lb	12 433	12 434
Ultimate analysis, dry basis:			
Carbon	%	76.23	75.52
Hydrogen	%	4.99	4.95
Sulphur	%	2.34	2.18
Nitrogen	%	1.29	1.33
Ash	%	10.36	12.89
Oxygen, by difference	%	4.79	3.13
Trace mercury	µg/g (ppm)	0.19	0.19
Ash fusibility temperature:			
Initial	°C	1105	1115
Spherical	°C	1220	1305
Hemispherical	°C	1300	1360
Fluid	°C	1370	1390
Hardgrove grindability index		-	-
Free swelling index		7.0	6.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		3-5-78	19-9-78
Sampling location		Mine Loading Head	Seaboard Power Station
Product name		Course Slack	
Screen opening, mm		Minus 51, sq	
ERL number		2810-78	2809-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	1.79	1.71
Sulfate sulphur	%	0.07	0.01
Organic sulphur	%	0.48	0.46
Moisture (as rec'd):			
Inherent	%	1.82	1.49
Adherent	%	5.60	5.45
Ash analysis, %:			
SiO_2		39.18	44.18
Al_2O_3		21.17	24.71
Fe_2O_3		28.17	21.39
TiO_2		0.85	0.90
P_2O_5		0.00	0.00
CaO		1.53	1.32
MgO		1.48	1.68
SO_3		1.50	1.13
Na_2O		0.75	0.67
K_2O		3.00	3.54
SrO		-	-
BaO		-	-
LOF		-	-

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	4-6-80	
Sampling location	Section A Room & Pillar Mining	
Product name	Course Slack	
Screen opening, mm	Minus 51, sq	
ERL number	3691-80	3692-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture %	2.12	1.24
Ash %	11.24	30.31
Volatile matter %	34.94	28.91
Fixed carbon %	51.70	39.54
Sulphur, as rec'd: %	1.55	1.59
Calorific value, as rec'd:		
MJ/kg	30.17	23.62
Btu/lb	12 969	10 154
Ultimate analysis, dry basis:		
Carbon %	75.40	59.49
Hydrogen %	5.12	4.07
Sulphur %	1.58	1.61
Nitrogen %	2.01	1.57
Ash %	11.48	30.69
Oxygen, by difference %	4.41	2.58
Trace mercury µg/g (ppm)	0.17	0.12
Ash fusibility temperature:		
Initial °C	1210	1230
Spherical °C	1340	1345
Hemispherical °C	1380	1390
Fluid °C	1450	1425
Hardgrove grindability index	57	58
Free swelling index	7.5	6.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		4-6-80	
Sampling location		Section A Room & Pillar Mining	
Product name		Course Slack	
Screen opening, mm		Minus 51, sq	
ERL number		3691-80	3692-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	1.10	1.11
Sulfate sulphur	%	0.00	0.00
Organic sulphur	%	0.48	0.50
Moisture (as rec'd):			
Inherent	%	2.12	1.24
Adherent	%	-	-
Ash analysis, %:			
SiO_2		47.61	57.16
Al_2O_3		23.83	20.79
Fe_2O_3		17.68	12.15
TiO_2		0.88	0.99
P_2O_5		0.14	0.21
CaO		1.50	0.86
MgO		1.37	1.59
SO_3		1.12	0.46
Na_2O		0.65	0.55
K_2O		3.25	3.03
SrO		0.02	0.02
BaO		0.14	0.13
LOF		0.00	0.42

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		13-6-80	
Sampling location		Coal Preparation Plant Victoria Junction	
Product name		Raw Feed	Course Screen
Screen opening, mm		38 x 0, sq	38 x 28 mesh
ERL number		3712-80	3711-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	5.36	5.34
Ash	%	16.83	2.20
Volatile matter	%	31.14	36.45
Fixed carbon	%	46.67	56.01
Sulphur, as rec'd	%	1.66	1.18
Calorific value, as rec'd:			
	MJ/kg	27.44	33.05
	Btu/lb	11 797	14 210
Ultimate analysis, dry basis:			
Carbon	%	68.78	83.44
Hydrogen	%	4.76	5.92
Sulphur	%	1.75	1.25
Nitrogen	%	1.65	1.88
Ash	%	17.78	2.32
Oxygen, by difference	%	5.28	5.19
Trace mercury	µg/g (ppm)	0.13	0.10
Ash fusibility temperature:			
Initial	°C	1180	1045
Spherical	°C	1305	1120
Hemispherical	°C	1360	1177
Fluid	°C	1380	1266
Hardgrove grindability index		62	61
Free swelling index		6.0	7.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	13-6-80	
Sampling location	Coal Preparation Plant Victoria Junction	
Product name	Raw Feed	Course Screen
Screen opening, mm	38 x 0, sq	38 x 28 mesh
ERL number	3712-80	3711-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.50	0.67
Sulfate sulphur .... %	0.02	0.00
Organic sulphur .... %	0.23	0.58
Moisture (as rec'd):		
Inherent .... %	1.40	1.32
Adherent .... %	3.96	4.02
Ash analysis, %:		
SiO_2		47.98
Al_2O_3		24.66
Fe_2O_3		16.14
TiO_2		0.86
P_2O_5		0.08
CaO		1.29
MgO		1.93
SO_3		1.10
Na_2O		0.82
K_2O		3.77
SrO		0.02
BaO		0.00
LOF		0.28

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	3-6-80	13-5-80
Sampling location	Mine Conveyor	
Product name	Crushed Slack	
Screen opening, mm	Minus 51, sq	
ERL number	3693-80	3695-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.51	2.19
Ash .... %	18.63	6.47
Volatile matter .... %	32.60	35.25
Fixed carbon .... %	47.26	56.09
Sulphur, as rec'd .... %	2.00	1.29
Calorific value, as rec'd:		
MJ/kg	27.91	31.72
Btu/lb	11 999	13 637
Ultimate analysis, dry basis:		
Carbon .... %	68.34	78.61
Hydrogen .... %	4.60	5.24
Sulphur .... %	2.03	1.32
Nitrogen .... %	1.61	2.02
Ash .... %	18.92	6.61
Oxygen, by difference .... %	4.50	6.20
Trace mercury µg/g (ppm)	0.18	0.16
Ash fusibility temperature:		
Initial .... °C	1230	1120
Spherical .... °C	1345	1230
Hemispherical .... °C	1390	1270
Fluid .... °C	1425	1355
Hardgrove grindability index	62	60
Free swelling index	7.5	7.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	3-6-80	13-5-80
Sampling location		Mine Conveyor
Product name		Crushed Slack
Screen opening, mm		Minus 51, sq
ERL number	3693-80	3695-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.25	0.84
Sulfate sulphur .... %	0.00	0.01
Organic sulphur .... %	0.78	0.47
Moisture (as rec'd):		
Inherent .... %	1.51	2.19
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	47.74	36.12
Al_2O_3	24.88	20.22
Fe_2O_3	15.85	24.53
TiO_2	0.81	0.73
P_2O_5	0.09	0.12
CaO	1.07	5.41
MgO	1.69	1.32
SO_3	1.06	5.82
Na_2O	0.81	0.77
K_2O	3.92	2.27
SrO	0.02	0.01
BaO	0.14	0.06
LOF	0.00	0.00

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		15-7-80	15-7-80	15-7-80
Sampling location		(Gantry) Section A	(Silo)	Lingan Power Station
Product name			Course Slack	
Screen opening, mm			Minus 51, sq	
ERL number		4162-80	4163-80	4164-80
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	3.16	3.93	7.35
Ash	%	7.91	10.81	25.40
Volatile matter	%	35.25	33.82	27.08
Fixed carbon	%	53.68	51.44	40.17
Sulphur, as rec'd	%	2.77	1.17	1.70
Calorific value, as rec'd:				
	MJ/kg	30.87	29.93	23.41
	Btu/lb	13 271	12 870	10 067
Ultimate analysis, dry basis:				
Carbon	%	76.37	76.86	61.67
Hydrogen	%	5.41	5.34	4.41
Sulphur	%	2.86	1.22	1.84
Nitrogen	%	1.46	1.33	1.13
Ash	%	8.17	11.25	27.41
Oxygen, by difference	%	5.73	6.00	3.50
Trace mercury	µg/g (ppm)	0.21	0.08	0.10
Ash fusibility temperature:				
Initial	°C	1060	1230	1250
Spherical	°C	1130	1325	1345
Hemispherical	°C	1250	1360	1415
Fluid	°C	1330	1370	1450
Hardgrove grindability index		58	59	60
Free swelling index		7.0	8.0	7.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		15-7-80	15-7-80	15-7-80
Sampling location		(Gantry) Section A	(Silo)	Lingan Power Station
Product name			Course Slack	
Screen opening, mm			Minus 51, sq	
ERL number		4162-80	4163-80	4164-80
Sulphur Forms (dry basis):				
Pyritic sulphur	%	1.74	0.81	1.46
Sulfate sulphur	%	0.06	0.01	0.01
Organic sulphur	%	1.06	0.40	0.37
Moisture (as rec'd):				
Inherent	%	2.19	1.50	1.42
Adherent	%	0.97	2.43	5.93
Ash analysis, %:				
SiO_2		33.46	46.27	53.41
Al_2O_3		18.83	23.38	23.72
Fe_2O_3		37.48	20.92	12.94
TiO_2		0.84	0.87	0.92
P_2O_5		0.07	0.11	0.09
CaO		3.15	1.48	0.89
MgO		0.87	1.54	1.50
SO_3		2.73	1.52	0.87
Na_2O		0.53	0.71	0.73
K_2O		1.67	3.31	3.73
SrO		0.00	0.02	0.02
BaO		0.00	0.06	0.08
LOF		0.80	0.00	0.00

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	11-7-80		
Sampling location	Wash Plant, Sydney Mines		
Product name	Egg	Nut	Course Slack
Screen opening, mm	Plus 44, rd	44 x 64, rd	Minus 44, rd
ERL number	4168-80	4169-80	4170-80
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture .... %	4.95	5.72	8.77
Ash .... %	3.88	3.59	7.23
Volatile matter .... %	35.49	36.00	33.09
Fixed carbon .... %	55.68	54.69	50.91
Sulphur, equil .... %	2.30	2.33	1.86
Calorific value, as rec'd:			
MJ/kg	31.96	31.70	29.28
Btu/lb	13 739	13 627	12 588
Ultimate analysis, dry basis:			
Carbon .... %	80.28	81.26	78.80
Hydrogen .... %	5.74	5.84	5.71
Sulphur .... %	2.42	2.47	2.04
Nitrogen .... %	1.51	1.53	1.50
Ash .... %	4.08	3.81	7.92
Oxygen, by difference .... %	5.97	5.09	4.03
Trace mercury µg/g (ppm)	0.13	0.15	0.13
Ash fusibility temperature:			
Initial .... °C	1115	1100	1055
Spherical .... °C	1195	1165	1215
Hemispherical .... °C	1220	1240	1280
Fluid .... °C	1280	1315	1310
Hardgrove grindability index	56	56	57
Free swelling index	6.5	4.5	7.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	11-7-80		
Sampling location	Wash Plant, Sydney Mines		
Product name	Egg	Nut	Course Slack
Screen opening, mm	Plus 44, rd	44 x 64, rd	Minus 44, rd
ERL number	4168-80	4169-80	4170-80
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	1.73	1.56	1.21
Sulfate sulphur .... %	0.01	0.04	0.03
Organic sulphur .... %	0.68	0.87	0.80
Moisture (as rec'd):			
Inherent .... %	2.42	2.72	2.75
Adherent .... %	2.53	3.00	6.02
Ash analysis, %:			
SiO_2	17.78	22.85	40.58
Al_2O_3	11.21	14.03	20.34
Fe_2O_3	62.81	57.98	28.45
TiO_2	0.50	0.68	0.80
P_2O_5	0.51	0.53	0.12
CaO	2.73	1.06	2.53
MgO	0.52	0.41	1.38
SO_3	1.49	0.49	2.44
Na_2O	0.63	0.67	0.55
K_2O	0.43	0.72	2.56
SrO	-	-	0.02
BaO	-	-	0.00
LOF	-	-	0.00

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		11-7-80	
Sampling location		Wash Plant, Sydney Mines	
Product name		Pea	Fines
Screen opening, mm		19 x 64, rd	Minus 6.4, rd
ERL number		4171-80	4172-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	10.51	7.55
Ash	%	4.81	11.77
Volatile matter	%	33.39	31.11
Fixed carbon	%	51.29	49.57
Sulphur, as rec'd	%	3.04	1.57
Calorific value, as rec'd:			
	MJ/kg	28.76	28.02
	Btu/lb	12 366	12 047
Ultimate analysis, dry basis:			
Carbon	%	64.66	77.01
Hydrogen	%	4.28	5.42
Sulphur	%	3.41	1.70
Nitrogen	%	1.22	1.48
Ash	%	5.38	12.73
Oxygen, by difference	%	21.05	1.66
Trace mercury	µg/g (ppm)	0.14	0.13
Ash fusibility temperature:			
Initial	°C	1105	1165
Spherical	°C	1195	1350
Hemispherical	°C	1280	1365
Fluid	°C	1395	1400
Hardgrove grindability index		59	58
Free swelling index		4.5	6.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date	11-7-80	
Sampling location	Wash Plant, Sydney Mines	
Product name	Pea	Fines
Screen opening, mm	19 x 64, rd	Minus 6.4, rd
ERL number	4171-80	4172-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.94	1.18
Sulfate sulphur .... %	0.08	0.02
Organic sulphur .... %	1.39	0.50
Moisture (as rec'd):		
Inherent .... %	4.58	2.58
Adherent .... %	5.93	4.97
Ash analysis, %:		
SiO_2	25.92	
Al_2O_3	15.31	
Fe_2O_3	51.83	
TiO_2	0.74	
P_2O_5	0.21	
CaO	1.66	
MgO	0.78	
SO_3	1.60	
Na_2O	0.68	
K_2O	0.88	
SrO	0.03	
BaO	0.00	
LOF	0.00	

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		24-3-81	
Sampling location		(Gantry) Section A	(Silo)
Product name		Mine Run	
Screen opening, mm			
ERL number		3340-81	3341-81
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	4.31	3.26
Ash	%	5.74	23.41
Volatile matter	%	34.02	28.11
Fixed carbon	%	55.93	45.22
Sulphur, as rec'd	%	1.74	2.18
Calorific value, as rec'd:			
	MJ/kg	31.22	25.46
	Btu/lb	13 425	10 948
Ultimate analysis, dry basis:			
Carbon	%	77.41	59.26
Hydrogen	%	4.82	3.80
Sulphur	%	1.82	2.25
Nitrogen	%	1.27	0.94
Ash	%	6.00	24.20
Oxygen, by difference	%	8.68	9.55
Trace mercury	µg/g (ppm)	0.22	0.15
Ash fusibility temperature:			
Initial	°C	1024	1227
Spherical	°C	1135	1352
Hemispherical	°C	1143	1407
Fluid	°C	1207	1457
Hardgrove grindability index		58	58
Free swelling index		7.0	6.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		24-3-81	
Sampling location		(Gantry) Section A	(Silo)
Product name		Mine Run	
Screen opening, mm			
ERL number		3340-81	3341-81
Sulphur Forms (dry basis):			
Pyritic sulphur	%	1.20	1.91
Sulfate sulphur	%	0.01	0.02
Organic sulphur	%	0.61	0.32
Moisture (as rec'd):			
Inherent	%	0.94	0.87
Adherent	%	3.37	2.39
Ash analysis, %:			
SiO_2		25.01	51.41
Al_2O_3		14.29	25.95
Fe_2O_3		32.76	13.81
TiO_2		0.62	0.88
P_2O_5		0.11	0.05
CaO		10.81	0.78
MgO		0.96	1.92
SO_3		9.70	0.92
Na_2O		0.74	0.74
K_2O		1.39	4.20
SrO		0.01	0.01
BaO		0.00	0.00
LOF		4.49	0.81

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date		21-11-80	
Sampling location		Mine	
Product name		Screen	Slack
Screen opening, mm		Plus 75, rd	Minus 75, rd
ERL number		2454-81	2453-81
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	0.61	5.51
Ash	%	4.95	12.90
Volatile matter	%	32.33	28.90
Fixed carbon	%	62.11	52.69
Sulphur, as rec'd	%	0.70	0.68
Calorific value, as rec'd:			
	MJ/kg	33.93	29.07
	Btu/lb	11 587	12 500
Ultimate analysis, dry basis:			
Carbon	%	82.35	74.66
Hydrogen	%	5.49	4.93
Sulphur	%	0.70	0.72
Nitrogen	%	1.75	1.49
Ash	%	4.98	13.65
Oxygen, by difference	%	4.73	4.55
Trace mercury	µg/g (ppm)	0.06	0.07
Ash fusibility temperature:			
Initial	°C	1121	1138
Spherical	°C	1171	1288
Hemispherical	°C	1182	1315
Fluid	°C	1260	1338
Hardgrove grindability index		65	70
Free swelling index		6.5	6.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date	21-11-80	
Sampling location	Mine	
Product name	Screen	Slack
Screen opening, mm	Plus 75, rd	Minus 75, rd
ERL number	2454-81	2453-81
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.38	0.54
Sulfate sulphur .... %	0.00	0.00
Organic sulphur .... %	0.32	0.18
Moisture (as rec'd):		
Inherent .... %	0.61	0.64
Adherent .... %	-	4.87
Ash analysis, %:		
SiO_2	38.72	48.76
Al_2O_3	15.67	21.15
Fe_2O_3	34.73	16.96
TiO_2	0.73	0.93
P_2O_5	0.18	0.15
CaO	2.09	3.18
MgO	1.84	1.49
SO_3	2.27	2.90
Na_2O	0.58	0.97
K_2O	1.67	3.00
SrO	0.00	0.03
BaO	0.00	0.07
LOF	0.42	0.85

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date	25-3-81	
Sampling location	Mine	
Product name	Screen	Slack
Screen opening, mm	Plus 75, rd	Minus 75, rd
ERL number	3342-81	3343-81
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	0.46	3.62
Ash .... %	3.41	7.28
Volatile matter .... %	32.26	30.41
Fixed carbon .... %	63.87	58.69
Sulphur, as rec'd .... %	0.90	0.93
Calorific value, as rec'd:		
MJ/kg	34.59	31.31
Btu/lb	14 872	13 462
Ultimate analysis, dry basis:		
Carbon .... %	83.32	78.73
Hydrogen .... %	5.20	4.89
Sulphur .... %	0.90	0.96
Nitrogen .... %	1.31	1.37
Ash .... %	3.43	7.55
Oxygen, by difference .... %	5.84	6.49
Trace mercury µg/g (ppm)	0.07	0.06
Ash fusibility temperature:		
Initial .... °C	1093	1107
Spherical .... °C	1268	1229
Hemispherical .... °C	1346	1324
Fluid .... °C	1357	1332
Hardgrove grindability index	69	68
Free swelling index	7.5	7.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date		25-3-81	
Sampling location		Mine	
Product name		Screen	Slack
Screen opening, mm		Plus 75, rd	Minus 75, rd
ERL number		3342-81	3343-81
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.32	0.46
Sulfate sulphur	%	0.00	0.01
Organic sulphur	%	0.58	0.49
Moisture (as rec'd):			
Inherent	%	0.46	0.84
Adherent	%	-	2.78
Ash analysis, %:			
SiO_2		39.33	43.01
Al_2O_3		23.16	21.47
Fe_2O_3		27.84	20.79
TiO_2		1.14	0.88
P_2O_5		0.17	0.19
CaO		1.43	3.33
MgO		1.46	1.79
SO_3		1.57	3.32
Na_2O		0.91	1.07
K_2O		1.67	2.73
SrO		0.01	0.02
BaO		0.00	0.02
LOF		1.16	1.55

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date		15-5-80	
Sampling location		Mine	
Product name		Screen	Slack
Screen opening, mm		Plus 51, sq	Minus 51, sq
ERL number		3696-80	3697-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	0.99	1.04
Ash	%	8.74	4.63
Volatile matter	%	32.52	33.60
Fixed carbon	%	57.75	60.73
Sulphur, as rec'd	%	1.38	0.59
Calorific value, as rec'd:			
	MJ/kg	32.19	34.07
	Btu/lb	13 838	14 648
Ultimate analysis, dry basis:			
Carbon	%	79.31	83.35
Hydrogen	%	5.21	5.46
Sulphur	%	1.39	0.60
Nitrogen	%	1.84	2.01
Ash	%	8.83	4.68
Oxygen, by difference	%	3.42	3.90
Trace mercury	µg/g (ppm)	0.24	0.03
Ash fusibility temperature:			
Initial	°C	1105	1115
Spherical	°C	1180	1195
Hemispherical	°C	1240	1270
Fluid	°C	1320	1315
Hardgrove grindability index		69	67
Free swelling index		8.0	6.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
No. 26 Colliery; Harbour Seam; Sydney Coalfield
Glace Bay, Cape Breton County, Nova Scotia

Sampling date	15-5-80	
Sampling location	Mine	
Product name	Screen	Slack
Screen opening, mm	Plus 51, sq	Minus 51, sq
ERL number	3696-80	3697-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.85	0.13
Sulfate sulphur .... %	0.00	0.00
Organic sulphur .... %	0.54	0.47
Moisture (as rec'd):		
Inherent .... %	0.99	1.04
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	43.95	39.80
Al_2O_3	19.96	22.38
Fe_2O_3	25.15	26.32
TiO_2	0.82	1.04
P_2O_5	0.09	0.12
CaO	1.41	1.83
MgO	1.46	1.97
SO_3	1.28	1.59
Na_2O	0.68	0.91
K_2O	2.53	2.12
SrO	0.01	0.02
BaO	0.04	0.00
LOF	0.28	0.14

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)

Lingan/No. 26 Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		13-6-80	
Sampling location		Coal Preparation Plant Victoria Junction	
Product name		Metallurgical Coal	Thermal Coal
Screen opening, mm		Minus 38, sq	Minus 38, sq
ERL number		3707-80	3708-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	8.06	4.17
Ash	%	2.42	3.29
Volatile matter	%	32.04	26.31
Fixed carbon	%	57.48	66.23
Sulphur, as rec'd	%	0.81	1.48
Calorific value, as rec'd:			
	MJ/kg	32.23	32.42
	Btu/lb	13 854	13 937
Ultimate analysis, dry basis:			
Carbon	%	84.66	82.78
Hydrogen	%	5.65	5.69
Sulphur	%	0.88	1.55
Nitrogen	%	1.98	1.88
Ash	%	2.63	3.43
Oxygen, by difference	%	4.21	4.67
Trace mercury	µg/g (ppm)	0.07	0.12
Ash fusibility temperature:			
Initial	°C	1100	1065
Spherical	°C	1190	1125
Hemispherical	°C	1260	1175
Fluid	°C	1370	1225
Hardgrove grindability index		61	58
Free swelling index		8.5	7.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan/No. 26 Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		13-6-80	
Sampling location		Coal Preparation Plant Victoria Junction	
Product name		Metallurgical Coal	Thermal Coal
Screen opening, mm		Minus 38, sq	Minus 38, sq
ERL number		3707-80	3708-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.29	0.86
Sulfate sulphur	%	0.01	0.01
Organic sulphur	%	0.58	0.68
Moisture (as rec'd):			
Inherent	%	1.06	1.24
Adherent	%	7.00	2.93
Ash analysis, %:			
SiO_2			28.95
Al_2O_3			17.67
Fe_2O_3			45.67
TiO_2			0.98
P_2O_5			0.18
CaO			1.49
MgO			0.88
SO_3			1.18
Na_2O			0.72
K_2O			0.96
SrO			0.00
BaO			0.00
LOF			0.06

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan/No. 26 Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		13-6-80	
Sampling location		Coal Preparation Plant Victoria Junction	
Product name		Fines	Course Reject
Screen opening, mm		Minus 6.4, sq	38 x 28 Mesh
ERL number		3713-80	3714-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	13.72	3.16
Ash	%	3.57	39.25
Volatile matter	%	29.43	22.65
Fixed carbon	%	53.28	34.94
Sulphur, as rec'd	%	1.09	1.42
Calorific value, as rec'd:			
	MJ/kg	29.77	-
	Btu/lb	12 711	-
Ultimate analysis, dry basis:			
Carbon	%	81.65	47.94
Hydrogen	%	5.63	3.23
Sulphur	%	1.26	1.47
Nitrogen	%	1.74	1.27
Ash	%	4.14	40.53
Oxygen, by difference	%	5.58	5.56
Trace mercury	µg/g (ppm)	0.10	0.90
Ash fusibility temperature:			
Initial	°C	1090	1205
Spherical	°C	1190	1300
Hemispherical	°C	1280	1350
Fluid	°C	1345	1365
Hardgrove grindability index		-	-
Free swelling index		8.0	1.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Lingan/No. 26 Mine; Harbour Seam; Sydney Coalfield
Lingan, Cape Breton County, Nova Scotia

Sampling date		13-6-80	
Sampling location		Coal Preparation Plant Victoria Junction	
Product name		Fines	Course Reject
Screen opening, mm		Minus 6.4, sq	38 x 28 Mesh
ERL number		3713-80	3714-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.68	-
Sulfate sulphur	%	0.00	-
Organic sulphur	%	0.58	-
Moisture (as rec'd):			
Inherent	%	1.22	1.34
Adherent	%	12.50	1.82
Ash analysis, %:			
SiO_2			45.58
Al_2O_3			25.27
Fe_2O_3			11.68
TiO_2			1.00
P_2O_5			0.08
CaO			2.42
MgO			1.60
SO_3			2.13
Na_2O			0.56
K_2O			3.90
SrO			0.03
BaO			0.00
LOF			0.49

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		12-5-80	15-7-80	23-3-81
Sampling location		Mine	Mine	Mine
Product name		Mine Run	Mine Run	Mine Run
Screen opening, mm				
ERL number		3694-80	4165-80	3329-81
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	9.35	4.31	6.77
Ash	%	13.83	10.02	12.56
Volatile matter	%	31.35	39.98	30.99
Fixed carbon	%	45.47	51.69	49.68
Sulphur, equil	%	3.64	5.22	3.97
Calorific value, as rec'd:				
	MJ/kg	25.71	28.61	26.82
	Btu/lb	11 054	12 298	11 531
Ultimate analysis, dry basis:				
Carbon	%	68.44	73.25	68.94
Hydrogen	%	4.53	5.09	4.46
Sulphur	%	4.01	5.46	4.26
Nitrogen	%	1.59	1.21	1.10
Ash	%	15.26	10.47	13.47
Oxygen, by difference	%	6.17	5.42	7.77
Trace mercury	µg/g (ppm)	0.23	0.19	0.19
Ash fusibility temperature:				
Initial	°C	1070	1095	1091
Spherical	°C	1170	1170	1129
Hemispherical	°C	1260	1230	1235
Fluid	°C	1320	1350	1318
Hardgrove grindability index		61	62	59
Free swelling index		3.5	3.5	4.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	12-5-80	15-7-80	23-3-81
Sampling location	Mine	Mine	Mine
Product name	Mine Run	Mine Run	Mine Run
Screen opening, mm			
ERL number	3694-80	4165-80	3329-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	2.60	3.85	2.67
Sulfate sulphur .... %	0.04	0.19	0.06
Organic sulphur .... %	1.37	1.42	1.53
Moisture (as rec'd):			
Inherent .... %	3.02	4.31	2.28
Adherent .... %	6.33	-	4.49
Ash analysis, %:			
SiO_2	39.29	26.27	40.00
Al_2O_3	22.87	14.85	18.63
Fe_2O_3	28.36	51.08	32.11
TiO_2	0.95	0.57	0.71
P_2O_5	0.36	0.22	0.20
CaO	2.55	1.96	2.02
MgO	0.73	0.91	1.07
SO_3	2.96	1.74	1.49
Na_2O	0.60	0.47	0.95
K_2O	1.33	1.21	1.70
SrO	0.02	0.00	0.03
BaO	0.11	0.00	0.00
LOF	0.12	0.18	0.11

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	16-7-80	16-3-81
Sampling location	Seaboard Generating Station (NSPC)	
Product name	Mine Run	Mine Run
Screen opening, mm		
ERL number	4173-80	3336-81
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	4.66	8.87
Ash .... %	10.59	19.31
Volatile matter .... %	33.47	28.34
Fixed carbon .... %	51.28	43.48
Sulphur, as rec'd .... %	4.03	4.45
Calorific value, as rec'd:		
MJ/kg	28.98	23.50
Btu/lb	12 460	10 104
Ultimate analysis, dry basis:		
Carbon .... %	72.76	61.38
Hydrogen .... %	5.03	3.93
Sulphur .... %	4.23	4.88
Nitrogen .... %	1.53	1.00
Ash .... %	11.11	21.19
Oxygen, by difference .... %	5.34	7.62
Trace mercury µg/g (ppm)	0.14	0.19
Ash fusibility temperature:		
Initial .... °C	1060	1110
Spherical .... °C	1195	1241
Hemispherical .... °C	1310	1343
Fluid .... °C	1350	1352
Hardgrove grindability index	63	61
Free swelling index	3.0	6.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	16-7-80	16-3-81
Sampling location	Seaboard Generating Station (NSPC)	
Product name	Mine Run	Mine Run
Screen opening, mm		
ERL number	4173-80	3336-81
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	2.89	3.94
Sulfate sulphur .... %	0.19	0.61
Organic sulphur .... %	1.15	0.33
Moisture (as rec'd):		
Inherent .... %	4.66	1.23
Adherent .... %	-	7.64
Ash analysis, %:		
SiO_2	34.50	42.19
Al_2O_3	19.48	22.48
Fe_2O_3	36.94	27.54
TiO_2	0.72	0.81
P_2O_5	0.09	0.14
CaO	2.13	1.20
MgO	1.53	0.83
SO_3	2.06	1.44
Na_2O	0.51	0.53
K_2O	1.65	2.35
SrO	0.02	0.03
BaO	0.00	0.00
LOF	0.00	0.70

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		21-5-80	
Sampling location		Wash Plant, Sydney Mines	
Product name		Egg	Nut
Screen opening, mm		Plus 44, rd	44 x 6.4, rd
ERL number		3678-80	3679-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	6.01	7.53
Ash	%	5.70	6.92
Volatile matter	%	36.23	33.93
Fixed carbon	%	52.06	51.62
Sulphur, as rec'd	%	2.88	2.92
Calorific value, as rec'd:			
	MJ/kg	30.28	29.08
	Btu/lb	13 018	12 501
Ultimate analysis, dry basis:			
Carbon	%	76.52	73.45
Hydrogen	%	5.17	4.93
Sulphur	%	3.07	3.16
Nitrogen	%	1.64	1.30
Ash	%	6.06	7.48
Oxygen, by difference	%	7.54	9.68
Trace mercury	µg/g (ppm)	0.26	0.19
Ash fusibility temperature:			
Initial	°C	1060	1080
Spherical	°C	1125	1180
Hemispherical	°C	1170	1260
Fluid	°C	1370	1370
Hardgrove grindability index		52	59
Free swelling index		6.5	5.5

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		21-5-80	
Sampling location		Wash Plant, Sydney Mines	
Product name		Egg	Nut
Screen opening, mm		Plus 44, rd	44 x 6.4, rd
ERL number		3678-80	3679-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	2.08	1.92
Sulfate sulphur	%	0.00	0.11
Organic sulphur	%	0.99	1.13
Moisture (as rec'd):			
Inherent	%	3.41	4.53
Adherent	%	2.60	3.00
Ash analysis, %:			
SiO_2		27.59	30.68
Al_2O_3		11.99	20.12
Fe_2O_3		16.99	41.16
TiO_2		0.83	0.87
P_2O_5		0.23	0.16
CaO		1.45	1.84
MgO		0.63	0.57
SO_3		1.00	1.29
Na_2O		0.73	0.64
K_2O		0.69	1.11
SrO		0.02	0.03
BaO		0.00	0.00
LOF		0.04	0.12

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		21-5-80	
Sampling location		Wash Plant, Sydney Mines	
Product name		Course Slack	Pea
Screen opening, mm		Minus 44, rd	19 x 6.4, rd
ERL number		3680-80	3681-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	10.68	6.30
Ash	%	5.09	5.31
Volatile matter	%	33.18	34.68
Fixed carbon	%	51.05	53.71
Sulphur, as rec'd	%	3.00	1.92
Calorific value, as rec'd:			
	MJ/kg	28.53	31.27
	Btu/lb	12 267	13 447
Ultimate analysis, dry basis:			
Carbon	%	75.49	79.55
Hydrogen	%	5.01	5.46
Sulphur	%	3.36	2.06
Nitrogen	%	1.44	1.49
Ash	%	5.70	5.67
Oxygen, by difference	%	9.00	5.77
Trace mercury	µg/g (ppm)	0.18	0.17
Ash fusibility temperature:			
Initial	°C	1115	1080
Spherical	°C	1180	1170
Hemispherical	°C	1200	1260
Fluid	°C	1305	1370
Hardgrove grindability index		60	58
Free swelling index		5.5	8.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	21-5-80	
Sampling location	Wash Plant, Sydney Mines	
Product name	Course Slack	Pea
Screen opening, mm	Minus 44, rd	19 x 6.4, rd
ERL number	3680-80	3681-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.93	1.35
Sulfate sulphur .... %	0.11	0.02
Organic sulphur .... %	1.32	0.69
Moisture (as rec'd):		
Inherent .... %	4.73	1.30
Adherent .... %	5.95	5.00
Ash analysis, %:		
SiO_2	23.28	30.63
Al_2O_3	15.26	18.64
Fe_2O_3	54.16	41.71
TiO_2	0.69	0.64
P_2O_5	0.08	0.18
CaO	1.65	1.46
MgO	0.73	1.25
SO_3	1.38	1.08
Na_2O	0.64	0.61
K_2O	0.74	2.03
SrO	0.00	0.01
BaO	0.00	0.08
LOF	0.78	0.48

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	21-5-80	
Sampling location	Wash Plant, Sydney Mines	
Product name	3/4 Slack	Fines
Screen opening, mm	Minus 19, rd	Minus 6.4, rd
ERL number	3682-80	3683-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	10.49	10.03
Ash .... %	6.11	12.34
Volatile matter .... %	32.98	31.16
Fixed carbon .... %	50.42	46.47
Sulphur, as rec'd .... %	2.84	3.74
Calorific value, as rec'd:		
MJ/kg	27.88	25.66
Btu/lb	11 983	11 032
Ultimate analysis, dry basis:		
Carbon .... %	74.26	67.95
Hydrogen .... %	4.79	4.23
Sulphur .... %	3.18	4.16
Nitrogen .... %	1.22	1.31
Ash .... %	6.83	13.72
Oxygen, by difference .... %	9.72	8.63
Trace mercury µg/g (ppm)	0.14	0.19
Ash fusibility temperature:		
Initial .... °C	1060	1105
Spherical .... °C	1115	1215
Hemispherical .... °C	1210	1265
Fluid .... °C	1345	1400
Hardgrove grindability index	61	63
Free swelling index	4.5	4.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	21-5-80	
Sampling location	Wash Plant, Sydney Mines	
Product name	3/4 Slack	Fines
Screen opening, mm	Minus 19, rd	Minus 6.4, rd
ERL number	3682-80	3683-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.66	2.49
Sulfate sulphur .... %	0.16	0.20
Organic sulphur .... %	1.36	1.47
Moisture (as rec'd):		
Inherent .... %	4.67	4.83
Adherent .... %	5.82	5.20
Ash analysis, %:		
SiO_2	30.28	33.59
Al_2O_3	19.01	20.22
Fe_2O_3	42.24	32.72
TiO_2	0.65	0.68
P_2O_5	0.26	0.16
CaO	1.52	2.77
MgO	0.94	1.47
SO_3	1.23	3.32
Na_2O	0.74	0.45
K_2O	1.55	1.88
SrO	0.03	0.03
BaO	0.12	0.00
LOF	0.56	1.31

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date 16-3-81
Sampling location Wash Plant, Sydney Mines

Product name	Raw Feed	Egg	Fines
Screen opening, mm		Plus 44, rd	Minus 6.4, rd
ERL number	3330-81	3331-81	3334-81
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture %	5.76	4.62	16.17
Ash %	37.12	4.87	19.40
Volatile matter %	24.67	35.45	24.60
Fixed carbon %	32.45	55.06	39.83
Sulphur, equil %	3.45	2.68	2.83
Calorific value, as rec'd:			
MJ/kg	17.89	30.72	21.68
Btu/lb	7690	13 208	9319
Ultimate analysis, dry basis:			
Carbon %	44.73	76.54	61.27
Hydrogen %	3.18	4.91	4.04
Sulphur %	3.66	2.81	3.37
Nitrogen %	0.73	1.16	1.05
Ash %	39.39	5.10	23.14
Oxygen, by difference %	8.31	9.48	7.13
Trace mercury µg/g (ppm)	0.13	0.15	0.17
Ash fusibility temperature:			
Initial °C	1354	1077	1177
Spherical °C	1482+	1196	1332
Hemispherical °C	1482+	1341	1352
Fluid °C	1482+	1393	1368
Hardgrove grindability index	54	57	69
Free swelling index	1.0	6.0	6.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	16-3-81		
Sampling location	Wash Plant, Sydney Mines		
Product name	Raw Feed	Egg	Fines
Screen opening, mm		Plus 44, rd	Minus 6.4, rd
ERL number	3330-81	3331-81	3334-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	2.57	1.54	2.22
Sulfate sulphur .... %	0.07	0.07	0.06
Organic sulphur .... %	1.02	1.20	1.09
Moisture (as rec'd):			
Inherent .... %	1.61	3.06	1.16
Adherent .... %	4.15	1.56	15.01
Ash analysis, %:			
SiO_2	51.28	28.44	43.92
Al_2O_3	30.60	18.22	23.46
Fe_2O_3	11.76	47.06	20.41
TiO_2	1.00	0.70	0.76
P_2O_5	0.41	0.53	0.15
CaO	0.64	2.02	3.16
MgO	1.19	0.00	1.57
SO_3	0.64	1.15	3.28
Na_2O	0.53	0.94	0.56
K_2O	1.98	0.81	2.96
SrO	0.12	0.03	0.02
BaO	0.00	0.00	0.00
LOF	0.10	0.41	0.90

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	16-3-81	
Sampling location	Wash Plant, Sydney Mines	
Product name	Oiled Nut	Oiled Pea
Screen opening, mm	44 x 6.4, rd	19 x 6.4, rd
ERL number	3332-81	3333-81
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	5.22	6.14
Ash .... %	6.21	3.51
Volatile matter .... %	34.29	32.00
Fixed carbon .... %	54.28	58.35
Sulphur, as rec'd .... %	3.23	1.47
Calorific value, as rec'd:		
MJ/kg	30.19	31.72
Btu/lb	12 977	13 641
Ultimate analysis, dry basis:		
Carbon .... %	75.76	79.38
Hydrogen .... %	4.85	5.07
Sulphur .... %	3.41	1.57
Nitrogen .... %	1.17	1.12
Ash .... %	6.55	3.74
Oxygen, by difference .... %	8.26	9.12
Trace mercury μg/g (ppm)	0.17	0.15
Ash fusibility temperature:		
Initial .... °C	1077	1082
Spherical .... °C	1196	1152
Hemispherical .... °C	1329	1279
Fluid .... °C	1379	1338
Hardgrove grindability index	58	57
Free swelling index	6.0	7.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
Prince Mine; Hub Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	16-3-81	
Sampling location	Wash Plant, Sydney Mines	
Product name	Oiled Nut	Oiled Pea
Screen opening, mm	44 x 6.4, rd	19 x 6.4, rd
ERL number	3332-81	3333-81
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	2.13	0.94
Sulfate sulphur .... %	0.00	0.00
Organic sulphur .... %	1.28	0.63
Moisture (as rec'd):		
Inherent .... %	2.25	1.70
Adherent .... %	2.97	4.44
Ash analysis, %:		
SiO_2	28.74	30.92
Al_2O_3	18.13	17.24
Fe_2O_3	48.04	42.61
TiO_2	0.74	0.84
P_2O_5	0.13	0.13
CaO	1.33	2.46
MgO	0.00	0.96
SO_3	1.20	2.39
Na_2O	0.77	0.76
K_2O	1.19	1.55
SrO	0.02	0.01
BaO	0.00	0.00
LOF	0.50	0.90

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
T. Brogan & Sons Construction Ltd.; Bonar Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		20-6-80	20-3-81
Sampling location		Trenton Power Station Nova Scotia Power Commission	Mine
Product name		Mine Run	Mine Run
Screen opening, mm			
ERL number		3685-80	3339-81
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	13.41	7.94
Ash	%	13.39	10.50
Volatile matter	%	30.22	31.85
Fixed carbon	%	42.98	49.71
Sulphur, as rec'd	%	6.92	4.19
Calorific value, as rec'd:			
	MJ/kg	23.59	26.53
	Btu/lb	10 143	11 405
Ultimate analysis, dry basis:			
Carbon	%	62.46	69.58
Hydrogen	%	3.81	4.18
Sulphur	%	8.00	4.55
Nitrogen	%	1.26	0.95
Ash	%	15.47	11.41
Oxygen, by difference	%	9.00	9.33
Trace mercury	µg/g (ppm)	-	0.12
Ash fusibility temperature:			
Initial	°C	1160	1102
Spherical	°C	1215	1143
Hemispherical	°C	1250	1232
Fluid	°C	1345	1324
Hardgrove grindability index		65	58
Free swelling index		1.5	3.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
T. Brogan & Sons Construction Ltd.; Bonar Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	20-6-80	20-3-81
Sampling location	Trenton Power Station Nova Scotia Power Commission	Mine
Product name	Mine Run	Mine Run
Screen opening, mm		
ERL number	3685-80	3339-81
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	-	3.88
Sulfate sulphur .... %	-	0.23
Organic sulphur .... %	-	0.44
Moisture (as rec'd):		
Inherent .... %	5.61	3.63
Adherent .... %	7.80	4.31
Ash analysis, %:		
SiO_2	26.39	33.06
Al_2O_3	14.11	16.12
Fe_2O_3	54.60	44.51
TiO_2	0.36	0.60
P_2O_5	0.27	0.33
CaO	0.92	0.92
MgO	0.72	0.98
SO_3	0.58	0.82
Na_2O	0.26	0.43
K_2O	0.98	1.87
SrO	0.00	0.12
BaO	0.18	0.00
LOF	0.44	0.83

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)
T. Brogan & Sons Construction Ltd.; Bonar Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		14-7-80	
Sampling location		Mine	
Product name Screen opening, mm		Mine Run (Upper Seam)	Mine Run (Lower Seam)
ERL number		4166-80	4167-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	5.00	7.24
Ash	%	14.76	6.42
Volatile matter	%	33.47	34.24
Fixed carbon	%	46.77	52.10
Sulphur, as rec'd	%	10.90	5.18
Calorific value, as rec'd:			
	MJ/kg	25.80	28.64
	Btu/lb	11 090	12 312
Ultimate analysis, dry basis:			
Carbon	%	64.23	74.29
Hydrogen	%	4.55	5.27
Sulphur	%	11.47	5.58
Nitrogen	%	1.14	1.38
Ash	%	15.54	6.92
Oxygen, by difference	%	3.07	6.56
Trace mercury	µg/g (ppm)	0.14	0.13
Ash fusibility temperature:			
Initial	°C	1230	1230
Spherical	°C	1240	1290
Hemispherical	°C	1255	1320
Fluid	°C	1290	1330
Hardgrove grindability index		65	56
Free swelling index		2.0	2.0

Notes:

CAPE BRETON DEVELOPMENT CORPORATION (CBDC)

T. Brogan & Sons Construction Ltd.; Bonar Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date	14-7-80	
Sampling location	Mine	
Product name	Mine Run	Mine Run
Screen opening, mm	(Upper Seam)	(Lower Seam)
ERL number	4166-80	4167-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	7.98	4.12
Sulfate sulphur .... %	0.35	0.28
Organic sulphur .... %	3.14	1.18
Moisture (as rec'd):		
Inherent .... %	5.00	7.24
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	11.15	10.46
Al_2O_3	6.50	5.96
Fe_2O_3	81.52	81.21
TiO_2	0.20	0.16
P_2O_5	0.14	0.22
CaO	0.70	1.25
MgO	0.00	0.51
SO_3	0.43	0.90
Na_2O	0.10	0.16
K_2O	0.28	0.21
SrO	0.00	0.01
BaO	0.00	0.00
LOF	0.00	0.00

Notes:

DRUMMOND COAL COMPANY LIMITED

Drummond Colliery; No. 1 (Scott Pit) Seam; Pictou Coalfield
Westville, Pictou County, Nova Scotia

Sampling date		15-7-78	19-6-80	23-10-80
Sampling location		Mine	Mine	Mine
Product name			Mine Run	
Screen opening, mm				
ERL number		4260-79	3686-80	4897-80
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	1.44	1.74	1.29
Ash	%	20.47	21.46	23.95
Volatile matter	%	25.65	26.24	26.10
Fixed carbon	%	52.44	50.56	48.66
Sulphur, as rec'd	%	2.94	2.43	2.90
Calorific value, as rec'd:				
	MJ/kg	26.79	26.00	25.39
	Btu/lb	11 518	11 176	10 917
Ultimate analysis, dry basis:				
Carbon	%	66.18	65.13	62.93
Hydrogen	%	4.21	3.73	4.06
Sulphur	%	2.98	2.47	2.94
Nitrogen	%	1.69	1.77	1.71
Ash	%	20.77	21.84	24.26
Oxygen, by difference	%	4.17	5.06	4.10
Trace mercury	µg/g (ppm)	0.04	-	0.06
Ash fusibility temperature:				
Initial	°C	1250	1325	1171
Spherical	°C	1400	1360	1321
Hemispherical	°C	1450	1380	1366
Fluid	°C	1480+	1470	1438
Hardgrove grindability index		55	55	58
Free swelling index		2.5	1.5	2.0

Notes:

DRUMMOND COAL COMPANY LIMITED

Drummond Colliery; No. 1 (Scott Pit) Seam; Pictou Coalfield
Westville, Pictou County, Nova Scotia

Sampling date	15-7-78	19-6-80	23-10-80
Sampling location	Mine	Mine	Mine
Product name		Mine Run	
Screen opening, mm			
ERL number	4260-79	3686-80	4897-80
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	1.98	-	2.31
Sulfate sulphur .... %	0.00	-	0.00
Organic sulphur .... %	1.00	-	0.63
Moisture (as rec'd):			
Inherent .... %	1.44	1.74	1.29
Adherent .... %	-	-	-
Ash analysis, %:			
SiO_2	53.45	53.80	49.46
Al_2O_3	24.31	24.15	22.25
Fe_2O_3	13.45	13.24	12.89
TiO_2	0.72	0.72	0.64
P_2O_5	0.49	0.51	0.37
CaO	1.48	1.71	4.19
MgO	1.00	1.01	1.46
SO_3	1.32	1.23	4.53
Na_2O	0.56	0.58	0.48
K_2O	2.12	1.84	1.87
SrO	0.05	0.05	0.04
BaO	0.07	0.02	0.06
LOF	0.62	0.66	0.69

Notes:

DRUMMOND COAL COMPANY LIMITED

Drummond Colliery; No. 1 (Scott Pit) Seam; Pictou Coalfield
Westville, Pictou County, Nova Scotia

Sampling date		17-9-81	13-5-81
Sampling location		Mine	
Product name		Mine Run	
Screen opening, mm			
ERL number		4640-81	2624-82
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	1.64	1.10
Ash	%	20.68	21.95
Volatile matter	%	26.67	23.13
Fixed carbon	%	51.01	53.82
Sulphur, as rec'd	%	2.39	3.84
Calorific value, as rec'd:			
	MJ/kg	26.76	25.83
	Btu/lb	11 504	13 104
Ultimate analysis, dry basis:			
Carbon	%	65.24	64.55
Hydrogen	%	4.05	3.94
Sulphur	%	2.43	3.88
Nitrogen	%	1.63	1.41
Ash	%	21.02	22.19
Oxygen, by difference	%	5.63	4.03
Trace mercury	μg/g (ppm)	0.06	0.10
Ash fusibility temperature:			
Initial	°C	1177	1129
Spherical	°C	1313	1302
Hemispherical	°C	1327	1363
Fluid	°C	1327	1379
Hardgrove grindability index		53	54
Free swelling index		1.5	1.0

Notes:

DRUMMOND COAL COMPANY LIMITED
Drummond Colliery; No. 1 (Scott Pit) Seam; Pictou Coalfield
Westville, Pictou County, Nova Scotia

Sampling date	17-9-81	13-5-81
Sampling location	Mine	
Product name	Mine Run	
Screen opening, mm		
ERL number	4640-81	2624-82
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	1.71	-
Sulfate sulphur .... %	0.06	-
Organic sulphur .... %	0.66	-
Moisture (as rec'd):		
Inherent .... %	1.64	1.10
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	52.94	50.53
Al_2O_3	23.02	23.24
Fe_2O_3	12.16	17.18
TiO_2	0.80	0.70
P_2O_5	0.42	0.52
CaO	3.33	1.42
MgO	1.08	1.02
SO_3	3.01	1.07
Na_2O	0.42	0.60
K_2O	1.96	1.93
SrO	0.04	0.04
BaO	0.00	0.12
LOF	0.46	0.16

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date		26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Lump	
Screen opening, mm		Plus 152, sq	
ERL number		3788-80 4875-80	4901-80 2114-81
Rank of coal		High-volatile B bituminous	
Proximate analysis, equil:			
Moisture	%	4.53	5.94
Ash	%	8.88	8.53
Volatile matter	%	32.26	37.02
Fixed carbon	%	54.33	48.51
Sulphur, equil	%	6.39	6.77
Calorific value, equil:			
	MJ/kg	27.64	27.88
	Btu/lb	11 884	11 985
Ultimate analysis, dry basis:			
Carbon	%	68.72	70.46
Hydrogen	%	4.70	4.57
Sulphur	%	6.69	7.20
Nitrogen	%	1.36	1.29
Ash	%	9.30	9.07
Oxygen, by difference	%	9.23	7.41
Trace mercury	µg/g (ppm)	0.13	0.09
Ash fusibility temperature:			
Initial	°C	1015	1049
Spherical	°C	1050	1065
Hemispherical	°C	1065	1071
Fluid	°C	1150	1654
Hardgrove grindability index		60	57
Free swelling index		2.0	2.5

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	26-10-79	30-10-80
Sampling location	Mine Dry Screening Plant	
Product name	Lump	
Screen opening, mm	Plus 152, sq	
ERL number	3788-80 4875-80	4901-80 2114-81
Sulphur Forms (dry basis):		
Pyritic sulphur .... %		3.53
Sulfate sulphur .... %		0.17
Organic sulphur .... %		3.50
Moisture (as rec'd):		
Inherent .... %		-
Adherent .... %		-
Ash analysis, %:		
SiO_2		22.33
Al_2O_3		8.91
Fe_2O_3		49.58
TiO_2		0.40
P_2O_5		1.27
CaO		6.28
MgO		0.78
SO_3		6.16
Na_2O		1.07
K_2O		0.55
SrO		0.01
BaO		0.14
LOF		1.53

Notes:

EVANS COAL MINES LIMITED

Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date		30-11-78	26-10-79	30-10-80
Sampling location			Mine Dry Screening Plant	
Product name			Medium Lump	
Screen opening, mm			152 x 83, sq	
ERL number		3963-78	3789-80 4876-80	4902-80 2114-81
Rank of coal			High-volatile B bituminous	
Proximate analysis, equil:				
Moisture	%	4.51	3.26	5.38
Ash	%	7.69	15.36	8.30
Volatile matter	%	34.66	32.29	36.71
Fixed carbon	%	23.14	49.09	23.14
Sulphur, equil	%	6.22	7.50	6.45
Calorific value, equil:				
	MJ/kg	29.46	25.67	28.28
	Btu/lb	12 667	11 034	12 158
Ultimate analysis, dry basis:				
Carbon	%	70.78	62.06	71.32
Hydrogen	%	4.57	4.20	4.63
Sulphur	%	6.51	7.75	6.82
Nitrogen	%	1.39	1.14	1.31
Ash	%	8.05	15.88	8.77
Oxygen, by difference	%	8.70	8.97	7.15
Trace mercury	µg/g (ppm)	0.09	0.15	0.10
Ash fusibility temperature:				
Initial	°C	1025	1060	1038
Spherical	°C	1055	1075	1049
Hemispherical	°C	1065	1115	1071
Fluid	°C	1205	1195	1204
Hardgrove grindability index		57	59	57
Free swelling index		2.5	2.0	1.5

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Medium Lump	
Screen opening, mm		152 x 83, sq	
ERL number	3963-78	3789-80 4876-80	4902-80 2114-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			3.08
Sulfate sulphur .... %			0.13
Organic sulphur .... %			3.61
Moisture (as rec'd):			
Inherent .... %			-
Adherent .... %			-
Ash analysis, %:			
SiO_2	24.02		27.57
Al_2O_3	8.78		10.34
Fe_2O_3	49.41		47.51
TiO_2	0.50		0.49
P_2O_5	1.25		0.83
CaO	5.91		4.60
MgO	0.47		0.74
SO_3	7.70		3.75
Na_2O	1.47		1.23
K_2O	0.49		0.61
SrO	-		0.01
BaO	-		0.19
LOF	-		1.05

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Egg	
Screen opening, mm		83 x 51, sq	
ERL number	3964-78	3790-80 4877-80	4903-80 2115-81
Rank of coal		High-volatile B bituminous	
Proximate analysis, equil:			
Moisture .... %	4.79	3.36	5.06
Ash .... %	9.64	8.81	10.13
Volatile matter .... %	34.06	35.41	36.49
Fixed carbon .... %	51.51	52.42	48.32
Sulphur, equil .... %	7.00	6.19	6.34
Calorific value, equil:			
MJ/kg	28.26	28.10	27.96
Btu/lb	12 148	12 080	12 023
Ultimate analysis, dry basis:			
Carbon .... %	70.42	70.11	69.72
Hydrogen .... %	4.29	4.55	4.55
Sulphur .... %	7.35	6.41	6.68
Nitrogen .... %	1.41	1.25	1.28
Ash .... %	10.12	9.12	10.67
Oxygen, by difference .... %	6.41	8.56	7.10
Trace mercury µg/g (ppm)	0.13	0.11	0.09
Ash fusibility temperature:			
Initial .... °C	-	1010	1060
Spherical .... °C	-	1050	1071
Hemispherical .... °C	-	1070	1116
Fluid .... °C	-	1125	1127
Hardgrove grindability index	58	59	57
Free swelling index	2.5	2.5	4.0

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Egg	
Screen opening, mm		83 x 51, sq	
ERL number	3964-78	3790-80 4877-80	4903-80 2115-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			3.07
Sulfate sulphur .... %			0.11
Organic sulphur .... %			3.50
Moisture (as rec'd):			
Inherent .... %			-
Adherent .... %			-
Ash analysis, %:			
SiO_2	25.54		34.05
Al_2O_3	9.48		11.38
Fe_2O_3	42.55		38.67
TiO_2	0.49		0.54
P_2O_5	0.50		0.61
CaO	3.88		4.33
MgO	0.88		1.15
SO_3	4.70		3.59
Na_2O	1.33		1.08
K_2O	0.65		1.09
SrO	-		0.01
BaO	-		0.15
LOF	-		1.10

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date		30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant		
Product name		Nut		
Screen opening, mm		51 x 19, sq		
ERL number		3965-78	3791-80 4878-80	4904-80 2116-81
Rank of coal		High-volatile B bituminous		
Proximate analysis, equil:				
Moisture	%	5.38	3.97	5.71
Ash	%	9.46	8.64	12.25
Volatile matter	%	33.04	36.02	35.08
Fixed carbon	%	52.12	51.37	46.96
Sulphur, as equil	%	6.98	6.27	6.03
Calorific value, equil:				
	MJ/kg	28.14	27.81	27.00
	Btu/lb	12 099	11 957	11 607
Ultimate analysis, dry basis:				
Carbon	%	70.29	68.54	67.62
Hydrogen	%	4.47	4.64	4.34
Sulphur	%	7.38	6.53	6.40
Nitrogen	%	1.43	1.26	1.20
Ash	%	10.00	9.00	12.99
Oxygen, by difference	%	6.43	10.03	7.45
Trace mercury	µg/g (ppm)	0.11	0.09	0.08
Ash fusibility temperature:				
Initial	°C	-	1005	1065
Spherical	°C	-	1054	1104
Hemispherical	°C	-	1071	1182
Fluid	°C	-	1193	1193
Hardgrove grindability index		60	59	59
Free swelling index		2.5	3.0	3.5

Notes:

EVANS COAL MINES LIMITED

Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Nut	
Screen opening, mm		51 x 19, sq	
ERL number	3965-78	3791-80 4878-80	4904-80 2116-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			3.34
Sulfate sulphur .... %			0.02
Organic sulphur .... %			3.04
Moisture (as rec'd):			
Inherent .... %			-
Adherent .... %			-
Ash analysis, %:			
SiO_2	26.22		32.50
Al_2O_3	10.93		14.05
Fe_2O_3	51.56		35.21
TiO_2	0.51		0.45
P_2O_5	0.39		0.41
CaO	3.25		5.78
MgO	0.80		1.65
SO_3	3.54		5.70
Na_2O	1.32		1.03
K_2O	0.88		1.74
SrO	-		0.01
BaO	-		0.25
LOF	-		1.37

Notes:

EVANS COAL MINES LIMITED

Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date		30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant		
Product name		Stoker Pea		
Screen opening, mm		19 x 6.4, sq		
ERL number		3966-78	3792-80 4879-80	4905-80 2117-81
Rank of coal		High-volatile B bituminous		
Proximate analysis, equil:				
Moisture	%	5.35	4.42	6.46
Ash	%	10.30	9.33	11.65
Volatile matter	%	32.63	34.97	35.52
Fixed carbon	%	51.72	51.28	46.37
Sulphur, equil	%	6.50	6.00	6.04
Calorific value, equil:				
	MJ/kg	27.96	27.81	26.66
	Btu/lb	12 022	11 956	11 462
Ultimate analysis, dry basis:				
Carbon	%	69.07	69.14	67.11
Hydrogen	%	4.40	4.79	4.26
Sulphur	%	6.86	6.28	6.46
Nitrogen	%	1.37	1.36	1.24
Ash	%	10.88	9.76	12.45
Oxygen, by difference	%	7.42	8.67	8.48
Trace mercury	μg/g (ppm)	0.09	0.09	0.07
Ash fusibility temperature:				
Initial	°C	-	1015	1065
Spherical	°C	-	1080	1099
Hemispherical	°C	-	1095	1121
Fluid	°C	-	1240	1204
Hardgrove grindability index		62	59	63
Free swelling index		2.0	4.0	1.0

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Stoker Pea	
Screen opening, mm		19 x 6.4, sq	
ERL number	3966-78	3792-80 4879-80	4905-80 2117-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			2.47
Sulfate sulphur .... %			0.48
Organic sulphur .... %			3.51
Moisture (as rec'd):			
Inherent .... %			-
Adherent .... %			-
Ash analysis, %:			
SiO_2	28.01		30.85
Al_2O_3	11.83		13.47
Fe_2O_3	46.73		33.90
TiO_2	0.48		0.49
P_2O_5	0.45		0.53
CaO	4.28		6.51
MgO	0.83		1.48
SO_3	4.89		7.24
Na_2O	1.34		0.86
K_2O	1.18		1.56
SrO	-		0.01
BaO	-		0.17
LOF	-		1.27

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date		30-11-78	26-10-79	30-10-80
Sampling location			Mine Dry Screening Plant	
Product name			Fines	
Screen opening, mm			Minus 6.4, sq	
ERL number		3967-78	3793-80 4880-80	4906-80 2118-81
Rank of coal			High-volatile B bituminous	
Proximate analysis, equil:				
Moisture	%	5.49	5.05	4.91
Ash	%	10.12	12.55	13.63
Volatile matter	%	31.99	34.12	34.86
Fixed carbon	%	48.40	48.28	46.60
Sulphur, equil	%	6.01	5.74	6.42
Calorific value, equil:				
	MJ/kg	26.55	25.94	26.66
	Btu/lb	11 416	11 155	11 460
Ultimate analysis, dry basis:				
Carbon	%	66.34	65.52	65.31
Hydrogen	%	4.26	4.50	4.20
Sulphur	%	6.36	6.05	6.75
Nitrogen	%	1.31	1.31	1.21
Ash	%	14.94	13.22	14.33
Oxygen, by difference	%	6.79	9.40	8.20
Trace mercury	µg/g (ppm)	0.12	0.08	0.07
Ash fusibility temperature:				
Initial	°C	-	1015	1082
Spherical	°C	-	1115	1110
Hemispherical	°C	-	1140	1171
Fluid	°C	-	1180	1260
Hardgrove grindability index		64	64	63
Free swelling index		1.0	2.5	3.5

Notes:

EVANS COAL MINES LIMITED
Evans Mines; No. 5 Seam; Inverness Coalfield
St. Rose, Inverness County, Nova Scotia

Sampling date	30-11-78	26-10-79	30-10-80
Sampling location		Mine Dry Screening Plant	
Product name		Fines	
Screen opening, mm		Minus 6.4, sq	
ERL number	3967-78	3793-80 4880-80	4906-80 2118-81
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			3.66
Sulfate sulphur .... %			0.05
Organic sulphur .... %			3.04
Moisture (as rec'd):			
Inherent .... %			-
Adherent .... %			-
Ash analysis, %:			
SiO_2	23.79		29.49
Al_2O_3	10.53		13.19
Fe_2O_3	30.93		35.05
TiO_2	0.43		0.44
P_2O_5	0.29		0.36
CaO	13.52		7.03
MgO	2.14		1.57
SO_3	15.93		7.44
Na_2O	1.11		0.97
K_2O	1.32		1.71
SrO	-		0.00
BaO	-		0.13
LOF	-		2.43

Notes:

RIVER HÉBERT COAL COMPANY LIMITED
Cochrane Mine; Kimberley Seam; Joggins Coalfield
River Hébert, Cumberland County, Nova Scotia

Sampling date		12-7-79	
Sampling location		Mine	
Product name		Screen	Slack
Screen opening, mm		Plus 38, sq	Minus 38, sq
ERL number		4256-79	4257-79
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	1.54	2.87
Ash	%	14.02	17.83
Volatile matter	%	34.95	32.47
Fixed carbon	%	49.49	46.83
Sulphur, as rec'd	%	7.91	5.41
Calorific value, as rec'd:			
	MJ/kg	28.34	26.40
	Btu/lb	12 186	11 348
Ultimate analysis, dry basis:			
Carbon	%	67.03	65.36
Hydrogen	%	4.69	4.50
Sulphur	%	8.03	5.55
Nitrogen	%	1.54	1.42
Ash	%	14.24	18.36
Oxygen, by difference	%	4.47	4.81
Trace mercury	μg/g (ppm)	0.41	0.21
Ash fusibility temperature:			
Initial	°C	1140	1040
Spherical	°C	1170	1080
Hemispherical	°C	1280	1095
Fluid	°C	1415	1120
Hardgrove grindability index		56	58
Free swelling index		4.0	2.0

Notes:

RIVER HÉBERT COAL COMPANY LIMITED
Cochrane Mine; Kimberley Seam; Joggins Coalfield
River Hébert, Cumberland County, Nova Scotia

Sampling date		12-7-79	
Sampling location		Mine	
Product name		Screen	Slack
Screen opening, mm		Plus 38, sq	Minus 38, sq
ERL number		4256-79	4257-79
Sulphur Forms (dry basis):			
Pyritic sulphur	%	4.67	2.90
Sulfate sulphur	%	0.21	0.17
Organic sulphur	%	3.15	2.48
Moisture (as rec'd):			
Inherent	%	1.54	1.92
Adherent	%	-	0.95
Ash analysis, %:			
SiO_2		36.71	18.55
Al_2O_3		16.81	8.35
Fe_2O_3		25.30	51.53
TiO_2		0.63	0.43
P_2O_5		0.80	0.86
CaO		6.35	7.84
MgO		1.50	0.83
SO_3		5.96	7.96
Na_2O		0.53	0.29
K_2O		2.76	0.84
SrO		0.02	0.01
BaO		0.00	0.00
LOF		1.30	1.98

Notes:

RIVER HÉBERT COAL COMPANY LIMITED
Cochrane Mine; Kimberley Seam; Joggins Coalfield
River Hébert, Cumberland County, Nova Scotia

Sampling date		12-7-79	
Sampling location		Harrison Lake Power Plant, Maccan, Nova Scotia	
Product name		Screen	Slack
Screen opening, mm		Plus 38, sq	Minus 38, sq
ERL number		4258-79	4259-79
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	1.83	2.63
Ash	%	10.45	19.11
Volatile matter	%	35.11	31.66
Fixed carbon	%	52.61	46.60
Sulphur, as rec'd	%	6.57	5.34
Calorific value, as rec'd:			
	MJ/kg	29.74	26.48
	Btu/lb	12 787	11 384
Ultimate analysis, dry basis:			
Carbon	%	70.40	64.65
Hydrogen	%	4.90	4.37
Sulphur	%	6.69	5.49
Nitrogen	%	1.62	1.40
Ash	%	10.84	19.63
Oxygen, by difference	%	5.75	4.46
Trace mercury	µg/g (ppm)	0.35	0.20
Ash fusibility temperature:			
Initial	°C	1080	1125
Spherical	°C	1150	1240
Hemispherical	°C	1205	1315
Fluid	°C	1305	1325
Hardgrove grindability index		57	57
Free swelling index		4.0	4.0

Notes:

RIVER HÉBERT COAL COMPANY LIMITED
Cochrane Mine; Kimberley Seam; Joggins Coalfield
River Hébert, Cumberland County, Nova Scotia

Sampling date	12-7-79	
Sampling location	Harrison Lake Power Plant, Maccan, Nova Scotia	
Product name	Screen	Slack
Screen opening, mm	Plus 38, sq	Minus 38, sq
ERL number	4258-79	4259-79
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	3.48	2.37
Sulfate sulphur .... %	0.07	0.07
Organic sulphur .... %	3.14	3.05
Moisture (as rec'd):		
Inherent .... %	1.83	1.96
Adherent .... %	-	0.67
Ash analysis, %:		
SiO_2	22.01	39.28
Al_2O_3	9.82	16.90
Fe_2O_3	48.86	23.98
TiO_2	0.48	0.61
P_2O_5	1.32	0.81
CaO	6.73	5.55
MgO	0.89	1.60
SO_3	6.35	5.97
Na_2O	0.33	0.53
K_2O	0.91	2.74
SrO	0.02	0.02
BaO	0.11	0.08
LOF	1.67	1.04

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date	24-10-80	
Sampling location	Stellarton Wash Plant	
Product name	Egg	Stoker
Screen opening, mm	Plus 19, sq	19 x 5, sq
ERL number	4900-80	4899-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	3.93	5.03
Ash .... %	27.96	32.00
Volatile matter .... %	25.30	23.28
Fixed carbon .... %	42.81	39.69
Sulphur, as rec'd .... %	0.95	0.69
Calorific value, as rec'd:		
MJ/kg	22.74	20.82
Btu/lb	9777	8953
Ultimate analysis, dry basis:		
Carbon .... %	59.17	54.97
Hydrogen .... %	3.78	3.52
Sulphur .... %	0.99	0.73
Nitrogen .... %	1.60	1.46
Ash .... %	29.10	33.70
Oxygen, by difference .... %	5.36	5.62
Trace mercury µg/g (ppm)	0.03	0.05
Ash fusibility temperature:		
Initial .... °C	1177	1216
Spherical .... °C	1438	1427
Hemispherical .... °C	1482+	1482+
Fluid .... °C	1482+	1482+
Hardgrove grindability index	56	58
Free swelling index	1.0	1.0

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date	24-10-80	
Sampling location	Stellarton Wash Plant	
Product name	Egg	Stoker
Screen opening, mm	Plus 19, sq	19 x 5, sq
ERL number	4900-80	4899-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.64	0.62
Sulfate sulphur .... %	0.09	0.10
Organic sulphur .... %	0.26	0.01
Moisture (as rec'd):		
Inherent .... %	1.31	1.51
Adherent .... %	2.62	3.52
Ash analysis, %:		
SiO_2	52.94	52.84
Al_2O_3	26.97	26.10
Fe_2O_3	7.50	9.78
TiO_2	0.69	0.74
P_2O_5	0.23	0.23
CaO	1.99	1.77
MgO	1.72	1.38
SO_3	1.97	1.36
Na_2O	0.23	0.25
K_2O	2.97	2.86
SrO	0.05	0.04
BaO	0.06	0.10
LOF	0.28	0.00

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date	19-6-80		
Sampling location	Stellarton Wash Plant		
Product name	Raw Feed	Screen	Slack
Screen opening, mm		Plus 19, sq	Minus 19, sq
ERL number	3689-80	3687-80	3688-80
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture %	12.81	7.52	12.23
Ash %	47.70	32.07	26.66
Volatile matter %	15.68	21.88	21.36
Fixed carbon %	23.81	38.53	39.75
Sulphur, as rec'd %	0.42	1.05	0.88
Calorific value, as rec'd:			
MJ/kg	11.50	19.56	20.06
Btu/lb	4945	8409	8624
Ultimate analysis, dry basis:			
Carbon %	35.53	53.71	55.92
Hydrogen %	2.40	3.65	3.89
Sulphur %	0.48	1.13	1.00
Nitrogen %	1.00	1.06	1.41
Ash %	54.70	34.68	30.38
Oxygen, by difference %	5.89	5.77	7.40
Trace mercury µg/g (ppm)	-	-	-
Ash fusibility temperature:			
Initial °C	1350	1480+	1440
Spherical °C	1480+	1480+	1480+
Hemispherical °C			
Fluid °C			
Hardgrove grindability index	71	55	59
Free swelling index	NA	1.5	0.5

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date		19-6-80		
Sampling location		Stellarton Wash Plant		
Product name		Raw Feed	Screen	Slack
Screen opening, mm			Plus 19, sq	Minus 19, sq
ERL number		3689-80	3687-80	3688-80
Sulphur Forms (dry basis):				
Pyritic sulphur	%			
Sulfate sulphur	%			
Organic sulphur	%			
Moisture (as rec'd):				
Inherent	%	3.81	2.02	2.73
Adherent	%	9.00	5.50	9.50
Ash analysis, %:				
SiO_2		55.08	55.41	54.02
Al_2O_3		28.36	31.12	29.68
Fe_2O_3		7.29	6.03	7.15
TiO_2		0.79	0.68	0.69
P_2O_5		0.13	0.13	0.20
CaO		1.16	0.44	0.64
MgO		1.21	0.87	0.85
SO_3		0.82	0.19	0.43
Na_2O		0.27	0.26	0.26
K_2O		3.05	3.48	3.27
SrO		0.04	0.04	0.06
BaO		0.11	0.09	0.11
LOF		1.17	0.78	0.83

Notes:

THORBURN MINING LIMITED

Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date		22-5-81		
Sampling location		Stellarton Wash Plant		
Product name		Raw Feed	Screen	Slack
Screen opening, mm			Plus 19, sq	Minus 19, sq
ERL number		2627-82	2625-82	2626-82
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	1.37	1.30	1.54
Ash	%	37.41	29.35	24.51
Volatile matter	%	23.93	23.58	23.69
Fixed carbon	%	37.29	45.77	50.26
Sulphur, as rec'd	%	0.93	1.09	1.01
Calorific value, as rec'd:				
	MJ/kg	18.58	22.73	24.33
	Btu/lb	7988	9774	10 458
Ultimate analysis, dry basis:				
Carbon	%	47.22	58.48	62.65
Hydrogen	%	3.04	3.74	3.93
Sulphur	%	0.94	1.10	1.03
Nitrogen	%	0.90	1.11	1.35
Ash	%	37.93	29.74	24.89
Oxygen, by difference	%	9.97	5.83	6.15
Trace mercury	µg/g (ppm)	0.06	0.08	0.10
Ash fusibility temperature:				
Initial	°C	1085	1188	1296
Spherical	°C	1313	1352	1460
Hemispherical	°C	1335	1393	1463
Fluid	°C	1363	1452	1482+
Hardgrove grindability index		54	54	54
Free swelling index		0.5	1.0	1.0

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date	22-5-81		
Sampling location	Stellarton Wash Plant		
Product name	Raw Feed	Screen	Slack
Screen opening, mm		Plus 19, sq	Minus 19, sq
ERL number	2627-82	2625-82	2626-82
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			
Sulfate sulphur .... %			
Organic sulphur .... %			
Moisture (as rec'd):			
Inherent .... %	1.37	1.30	1.54
Adherent .... %	-	-	-
Ash analysis, %:			
SiO_2	47.50	51.08	56.36
Al_2O_3	23.70	25.68	27.82
Fe_2O_3	14.86	8.74	7.88
TiO_2	0.62	0.66	0.73
P_2O_5	0.27	0.22	0.20
CaO	3.93	3.45	0.98
MgO	2.90	2.27	0.90
SO_3	2.82	3.13	0.46
Na_2O	0.22	0.27	0.27
K_2O	2.20	2.56	2.58
SrO	0.03	0.04	0.06
BaO	0.16	0.07	0.06
LOF	0.41	0.77	0.20

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date	18-9-81		
Sampling location	Stellarton Wash Plant		
Product name	Raw Feed	Screen	Slack
Screen opening, mm		Plus 19, sq	Minus 19, sq
ERL number	4644-81	4642-81	4643-81
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture %	2.16	2.56	7.20
Ash %	67.92	31.90	25.87
Volatile matter %	15.88	25.34	25.14
Fixed carbon %	14.04	40.20	41.79
Sulphur, as rec'd %	1.86	0.58	0.61
Calorific value, as rec'd:			
MJ/kg	6.92	21.42	21.96
Btu/lb	2975	9207	9441
Ultimate analysis, dry basis:			
Carbon %	19.56	54.34	57.87
Hydrogen %	1.66	3.46	3.68
Sulphur %	1.90	0.60	0.66
Nitrogen %	0.56	1.43	1.51
Ash %	69.42	32.74	27.88
Oxygen, by difference %	6.90	7.43	8.40
Trace mercury µg/g (ppm)	0.04	0.07	0.09
Ash fusibility temperature:			
Initial °C	1157	1371	1429
Spherical °C	1332	1482+	1471
Hemispherical °C	1393	1482+	1482+
Fluid °C	1418	1482+	1482+
Hardgrove grindability index	67	51	51
Free swelling index	NA	0.5	0.5

Notes:

THORBURN MINING LIMITED
Coal Reclamation Project; Waste Dumps; Pictou Coalfield
Stellarton, Pictou County, Nova Scotia

Sampling date		18-9-81		
Sampling location		Stellarton Wash Plant		
Product name		Raw Feed	Screen	Slack
Screen opening, mm			Plus 19, sq	Minus 19, sq
ERL number		4644-81	4642-81	4643-81
Sulphur Forms (dry basis):				
Pyritic sulphur	%	1.74	0.57	0.62
Sulfate sulphur	%	0.13	0.03	0.04
Organic sulphur	%	0.03	0.00	0.00
Moisture (as rec'd):				
Inherent	%	2.16	2.56	2.57
Adherent	%	-	-	4.63
Ash analysis, %:				
SiO_2		51.01	58.96	56.97
Al_2O_3		23.29	27.96	28.01
Fe_2O_3		16.68	4.73	5.30
TiO_2		0.75	0.96	0.92
P_2O_5		0.15	0.06	0.09
CaO		1.18	2.57	2.13
MgO		1.48	1.18	1.13
SO_3		1.56	1.13	0.73
Na_2O		0.23	0.42	0.37
K_2O		2.63	3.06	2.91
SrO		0.01	0.03	0.03
BaO		0.05	0.00	0.00
LOF		0.20	0.18	0.40

Notes:

NOVACO LIMITED
Sydney Main Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		12-3-81	9-3-81
Sampling location			
Product name		Slack	Mine Run
Screen opening, mm		Minus 38, rd	
ERL number		3337-81	3338-81
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	12.79	7.71
Ash	%	9.11	14.24
Volatile matter	%	31.16	31.60
Fixed carbon	%	46.94	46.45
Sulphur, as rec'd	%	4.16	5.36
Calorific value, as rec'd:			
	MJ/kg	25.98	25.38
	Btu/lb	11 169	10 912
Ultimate analysis, dry basis:			
Carbon	%	71.77	66.05
Hydrogen	%	4.26	4.12
Sulphur	%	4.77	5.81
Nitrogen	%	1.03	0.98
Ash	%	10.45	15.43
Oxygen, by difference	%	7.72	7.61
Trace mercury	µg/g (ppm)	0.17	0.30
Ash fusibility temperature:			
Initial	°C	1085	1096
Spherical	°C	1107	1135
Hemispherical	°C	1113	1204
Fluid	°C	1318	1285
Hardgrove grindability index		58	58
Free swelling index		3.5	3.5

Notes: A wholly owned Provincial Crown Corporation

NOVACO LIMITED
Sydney Main Seam; Sydney Coalfield
Point Aconi, Cape Breton County, Nova Scotia

Sampling date		12-3-81	9-3-81
Sampling location			
Product name		Slack	Mine Run
Screen opening, mm		Minus 38, rd	
ERL number		3337-81	3338-81
Sulphur Forms (dry basis):			
Pyritic sulphur	%	3.18	4.38
Sulfate sulphur	%	0.09	0.24
Organic sulphur	%	1.50	1.19
Moisture (as rec'd):			
Inherent	%	2.10	2.82
Adherent	%	10.69	4.89
Ash analysis, %:			
SiO_2		30.85	33.96
Al_2O_3		14.99	15.20
Fe_2O_3		48.68	46.70
TiO_2		0.63	0.66
P_2O_5		0.14	0.07
CaO		1.13	0.78
MgO		0.00	0.00
SO_3		1.11	0.71
Na_2O		0.32	0.30
K_2O		1.63	1.92
SrO		0.01	0.00
BaO		0.00	0.00
LOF		0.49	0.52

Notes:

COAL ANALYSES - NEW BRUNSWICK

N.B. COAL LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		20-8-79	30-9-80
Sampling location		Dragline 8200	Dragline 8200
Product name		Seam Sample	Seam Sample
Screen opening, mm			
ERL number		3778-80	4591-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	2.07	3.33
Ash	%	14.41	16.78
Volatile matter	%	32.79	31.65
Fixed carbon	%	50.73	48.24
Sulphur, as rec'd	%	5.84	6.72
Calorific value, as rec'd:			
	MJ/kg	29.31	28.17
	Btu/lb	12 599	12 111
Ultimate analysis, dry basis:			
Carbon	%	69.92	69.35
Hydrogen	%	4.37	4.81
Sulphur	%	5.96	6.95
Nitrogen	%	0.76	0.81
Ash	%	14.72	17.36
Oxygen, by difference	%	4.27	0.72
Trace mercury	µg/g (ppm)	0.25	0.25
Ash fusibility temperature:			
Initial	°C	1000	1060
Spherical	°C	1015	1065
Hemispherical	°C	1055	1138
Fluid	°C	1110	1204
Hardgrove grindability index		61	65
Free swelling index		6.0	6.0

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	20-8-79	30-9-80
Sampling location	Dragline 8200	Dragline 8200
Product name	Seam Sample	Seam Sample
Screen opening, mm		
ERL number	3778-80	4591-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	4.47	5.73
Sulfate sulphur .... %	0.09	0.00
Organic sulphur .... %	1.40	1.22
Moisture (as rec'd):		
Inherent .... %	1.32	1.02
Adherent .... %	0.75	2.31
Ash analysis, %:		
SiO_2	34.78	35.80
Al_2O_3	10.80	11.10
Fe_2O_3	40.68	41.21
TiO_2	0.64	0.59
P_2O_5	2.84	2.08
CaO	5.12	3.99
MgO	0.41	0.46
SO_3	1.07	1.19
Na_2O	0.19	0.12
K_2O	0.69	0.88
SrO	0.00	0.01
BaO	0.00	0.12
LOF	0.18	2.44

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		30-9-80	1-10-80
Sampling location		Grand Lake Power Station (NBEPC) Dragline 8200	
Product name		Mine Run	
Screen opening, mm			
ERL number		4592-80	4593-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	3.51	3.42
Ash	%	16.92	17.93
Volatile matter	%	31.03	30.96
Fixed carbon	%	48.54	47.69
Sulphur, as rec'd	%	7.50	7.45
Calorific value, as rec'd:			
	MJ/kg	27.66	27.55
	Btu/lb	11 891	11 845
Ultimate analysis, dry basis:			
Carbon	%	68.86	67.15
Hydrogen	%	4.80	4.59
Sulphur	%	7.77	7.71
Nitrogen	%	0.93	0.86
Ash	%	17.54	18.56
Oxygen, by difference	%	0.10	1.13
Trace mercury	µg/g (ppm)	0.29	0.33
Ash fusibility temperature:			
Initial	°C	1060	1065
Spherical	°C	1077	1071
Hemispherical	°C	1165	1138
Fluid	°C	1204	1271
Hardgrove grindability index		65	65
Free swelling index		6.5	6.0

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	30-9-80	1-10-80
Sampling location	Grand Lake Power Station (NBEPC) Dragline 8200	
Product name	Mine Run	
Screen opening, mm		
ERL number	4592-80	4593-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	6.64	6.16
Sulfate sulphur .... %	0.04	0.06
Organic sulphur .... %	1.09	1.49
Moisture (as rec'd):		
Inherent .... %	0.82	0.97
Adherent .... %	2.69	2.45
Ash analysis, %:		
SiO_2	31.99	33.14
Al_2O_3	11.19	11.58
Fe_2O_3	45.34	42.46
TiO_2	0.49	0.49
P_2O_5	1.54	1.72
CaO	3.47	3.84
MgO	0.52	0.49
SO_3	1.31	1.64
Na_2O	0.12	0.13
K_2O	1.24	1.29
SrO	0.00	0.00
BaO	0.10	0.12
LOF	3.14	2.94

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		22-8-79	3-10-80	3-10-80
Sampling location		Dragline 7200^2	Dragline 7200^2	Grand Lake Power Stn (NBEPC) Dragline 7200^2
Product name		Seam Sample	Seam Sample	Mine Run
Screen opening, mm				
ERL number		3785-80	4599-80	4600-80
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	4.21	2.99	3.01
Ash	%	19.63	13.95	13.54
Volatile matter	%	33.73	32.22	32.31
Fixed carbon	%	52.44	50.56	51.14
Sulphur, as rec'd	%	10.74	7.94	7.84
Calorific value, as rec'd:				
	MJ/kg	25.37	29.23	29.35
	Btu/lb	10 904	12 565	12 619
Ultimate analysis, dry basis:				
Carbon	%	61.40	68.93	70.10
Hydrogen	%	3.63	4.62	4.51
Sulphur	%	11.21	8.18	8.08
Nitrogen	%	0.63	0.93	1.04
Ash	%	20.49	14.38	13.96
Oxygen, by difference	%	2.90	2.96	2.31
Trace mercury	µg/g (ppm)	1.25	0.26	0.25
Ash fusibility temperature:				
Initial	°C	1045	1043	1038
Spherical	°C	1105	1049	1043
Hemispherical	°C	1125	1055	1055
Fluid	°C	1190	1115	1110
Hardgrove grindability index		59	64	64
Free swelling index		3.5	7.0	6.5

Notes:

N.B. COAL LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	22-8-79	3-10-80	3-10-80
Sampling location	Dragline 7200[2]	Dragline 7200[2]	Grand Lake Power Stn (NBEPC) Dragline 7200[2]
Product name	Seam Sample	Seam Sample	Mine Run
Screen opening, mm			
ERL number	3785-80	4599-80	4600-80
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	8.52	6.92	6.76
Sulfate sulphur .... %	1.00	0.08	0.04
Organic sulphur .... %	1.69	1.18	1.28
Moisture (as rec'd):			
Inherent .... %	2.27	1.00	0.94
Adherent .... %	1.94	1.99	2.07
Ash analysis, %:			
SiO_2	16.41	18.35	18.25
Al_2O_3	6.14	5.71	5.69
Fe_2O_3	62.15	62.66	62.68
TiO_2	0.26	0.30	0.30
P_2O_5	1.29	1.67	1.65
CaO	6.80	5.05	5.15
MgO	0.30	0.44	0.59
SO_3	5.13	2.16	2.56
Na_2O	0.12	0.12	0.12
K_2O	0.32	0.42	0.40
SrO	0.00	0.01	0.00
BaO	0.03	0.01	0.00
LOF	1.04	2.21	1.75

Notes:

N.B. COAL LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		21-8-79	22-8-79
Sampling location		Grand Lake Power Station (NBEPC) Dragline 9W	
Product name		Mine Run	
Screen opening, mm			
ERL number		3779-80	3780-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	2.43	3.19
Ash	%	20.61	25.26
Volatile matter	%	31.85	30.53
Fixed carbon	%	45.11	41.02
Sulphur, as rec'd	%	7.12	8.35
Calorific value, as rec'd:			
	MJ/kg	26.71	24.17
	Btu/lb	11 482	10 393
Ultimate analysis, dry basis:			
Carbon	%	63.91	60.29
Hydrogen	%	4.13	3.85
Sulphur	%	7.30	8.62
Nitrogen	%	0.63	0.55
Ash	%	21.13	26.09
Oxygen, by difference	%	2.90	0.60
Trace mercury	µg/g (ppm)	0.55	1.01
Ash fusibility temperature:			
Initial	°C	1010	1090
Spherical	°C	1105	1160
Hemispherical	°C	1145	1180
Fluid	°C	1205	1240
Hardgrove grindability index		64	64
Free swelling index		5.5	4.0

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	21-8-79	22-8-79
Sampling location	Grand Lake Power Station (NBEPC) Dragline 9W	
Product name	Mine Run	
Screen opening, mm		
ERL number	3779-30	3780-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	5.68	7.29
Sulfate sulphur .... %	0.25	0.58
Organic sulphur .... %	1.37	0.75
Moisture (as rec'd):		
Inherent .... %	1.25	1.52
Adherent .... %	1.18	1.67
Ash analysis, %:		
SiO_2	35.88	28.07
Al_2O_3	12.69	11.42
Fe_2O_3	35.83	39.41
TiO_2	0.58	0.44
P_2O_5	1.14	0.50
CaO	4.62	6.88
MgO	0.65	0.72
SO_3	4.03	7.55
Na_2O	0.22	0.15
K_2O	1.00	1.57
SrO	0.00	0.00
BaO	0.00	0.06
LOF	0.62	1.35

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	24-8-79	3-10-80
Sampling location	Dragline 9W	Dragline 9W
Product name	Seam Sample	Seam Sample
Screen opening, mm		
ERL number	3781-80	4603-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.70	1.73
Ash .... %	18.84	21.42
Volatile matter .... %	33.37	32.93
Fixed carbon .... %	46.09	43.92
Sulphur, as rec'd .... %	8.00	7.71
Calorific value, as rec'd:		
MJ/kg	27.51	27.15
Btu/lb	11 827	11 674
Ultimate analysis, dry basis:		
Carbon .... %	63.40	62.25
Hydrogen .... %	4.02	4.19
Sulphur .... %	8.14	7.85
Nitrogen .... %	0.87	1.05
Ash .... %	19.17	21.80
Oxygen, by difference .... %	4.40	2.86
Trace mercury μg/g (ppm)	0.76	0.71
Ash fusibility temperature:		
Initial .... °C	1070	1065
Spherical .... °C	1116	1105
Hemispherical .... °C	1140	1127
Fluid .... °C	1165	1227
Hardgrove grindability index	64	-
Free swelling index	4.5	6.0

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		24-8-79	3-10-80
Sampling location		Dragline 9W	Dragline 9W
Product name		Seam Sample	Seam Sample
Screen opening, mm			
ERL number		3781-80	4603-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	6.69	6.77
Sulfate sulphur	%	0.35	0.07
Organic sulphur	%	1.10	1.01
Moisture (as rec'd):			
Inherent	%	1.18	0.82
Adherent	%	0.52	0.91
Ash analysis, %:			
SiO_2		33.86	26.28
Al_2O_3		10.00	10.59
Fe_2O_3		45.76	39.40
TiO_2		0.57	0.44
P_2O_5		0.78	1.22
CaO		3.11	8.22
MgO		0.35	0.67
SO_3		2.45	6.48
Na_2O		0.20	0.09
K_2O		0.80	1.46
SrO		0.00	0.01
BaO		0.10	0.03
LOF		0.00	2.41

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	6-12-78	7-12-78	4-10-80
Sampling location	Grand Lake Power Station (NBEPC) Dragline 500W		Dragline 500W
Product name	Mine Run	Mine Run	Seam Sample
Screen opening, mm			
ERL number	2101-79	2102-79	4604-80
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture .... %	4.85	2.61	2.55
Ash .... %	22.23	19.13	16.44
Volatile matter .... %	28.80	31.36	31.73
Fixed carbon .... %	44.12	46.90	49.28
Sulphur, as rec'd .... %	9.55	9.19	7.27
Calorific value, as rec'd:			
MJ/kg	25.14	27.39	28.40
Btu/lb	10 809	11 777	12 210
Ultimate analysis, dry basis:			
Carbon .... %	60.76	60.63	67.21
Hydrogen .... %	4.37	4.13	4.62
Sulphur .... %	10.04	9.44	7.46
Nitrogen .... %	0.78	0.73	0.91
Ash .... %	23.36	19.64	16.87
Oxygen, by difference .... %	0.69	5.43	2.91
Trace mercury µg/g (ppm)	0.85	0.68	0.27
Ash fusibility temperature:			
Initial .... °C	1110	1115	1060
Spherical .... °C	1125	1140	1077
Hemispherical .... °C	1175	1175	1110
Fluid .... °C	1270	1275	1200
Hardgrove grindability index	62	62	-
Free swelling index	6.0	7.5	6.5

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	6-12-78	7-12-78	4-10-80
Sampling location	Grand Lake Power Station (NBEPC) Dragline 500W		Dragline 500W
Product name	Mine Run	Mine Run	Seam Sample
Screen opening, mm			
ERL number	2101-79	2102-79	4604-80
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	8.25	7.65	5.63
Sulfate sulphur .... %	0.37	0.17	0.09
Organic sulphur .... %	1.42	1.62	1.74
Moisture (as rec'd):			
Inherent .... %	0.96	0.41	1.03
Adherent .... %	3.89	2.20	1.52
Ash analysis, %:			
SiO_2	28.00	28.62	27.60
Al_2O_3	10.98	10.51	9.29
Fe_2O_3	23.88	24.79	46.43
TiO_2	0.51	0.50	0.47
P_2O_5	0.66	1.05	2.69
CaO	2.00	1.94	6.42
MgO	0.60	0.64	0.65
SO_3	2.07	0.81	2.45
Na_2O	0.05	0.07	0.12
K_2O	1.25	1.08	0.88
SrO	-	-	0.01
BaO	-	-	0.00
LOF	-	-	2.81

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		6-12-78	7-12-78	4-10-80
Sampling location		Grand Lake Power Station (NBEPC) Dragline 7400W		Dragline 7400W
Product name		Mine Run	Mine Run	Seam Sample
Screen opening, mm				
ERL number		2103-79	2104-79	3786-80
Rank of coal		High-volatile A bituminous		
Proximate analysis, as rec'd:				
Moisture	%	2.46	2.81	2.19
Ash	%	22.73	21.02	13.25
Volatile matter	%	30.46	30.68	36.32
Fixed carbon	%	44.35	45.49	48.24
Sulphur, as rec'd	%	9.58	9.44	6.87
Calorific value, as rec'd:				
	MJ/kg	25.79	26.60	29.74
	Btu/lb	11 091	11 433	12 788
Ultimate analysis, dry basis:				
Carbon	%	60.46	62.54	71.15
Hydrogen	%	4.20	4.43	4.47
Sulphur	%	9.83	9.72	7.02
Nitrogen	%	0.72	0.74	1.07
Ash	%	23.31	21.64	13.55
Oxygen, by difference	%	1.48	0.93	2.74
Trace mercury	µg/g (ppm)	0.77	0.78	0.23
Ash fusibility temperature:				
Initial	°C	1095	1060	1060
Spherical	°C	1110	1110	1110
Hemispherical	°C	1150	1180	1145
Fluid	°C	1220	1205	1200
Hardgrove grindability index		64	64	62
Free swelling index		7.0	7.0	6.5

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		6-12-78	7-12-78	22-8-79
Sampling location		Grand Lake Power Station (NBEPC) Dragline 7400W		Dragline 7400W
Product name		Mine Run	Mine Run	Seam Sample
Screen opening, mm				
ERL number		2103-79	2104-79	3786-80
Sulphur Forms (dry basis):				
Pyritic sulphur	%	8.08	8.11	5.70
Sulfate sulphur	%	0.30	0.23	0.27
Organic sulphur	%	1.45	1.38	1.05
Moisture (as rec'd):				
Inherent	%	0.67	0.49	1.43
Adherent	%	1.79	2.32	0.76
Ash analysis, %:				
SiO_2		30.39	27.30	23.27
Al_2O_3		11.48	10.44	9.76
Fe_2O_3		50.41	54.02	56.68
TiO_2		0.54	0.49	0.42
P_2O_5		0.88	0.85	1.37
CaO		2.17	2.64	2.97
MgO		0.93	0.62	0.39
SO_3		1.80	2.47	2.02
Na_2O		0.05	0.07	0.14
K_2O		1.35	1.12	1.10
SrO		-	-	0.00
BaO		-	-	0.02
LOF		-	-	0.30

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		5-12-78	
Sampling location		Wash Plant, Midlands	
Product name		Screen	Nut
Screen opening, mm		Plus 102, sq	64 x 19, sq
ERL number		2095-78	2096-78
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	0.80	1.26
Ash	%	15.84	17.50
Volatile matter	%	33.41	31.94
Fixed carbon	%	49.95	49.30
Sulphur, as rec'd	%	6.65	9.38
Calorific value, as rec'd:			
	MJ/kg	29.33	28.27
	Btu/lb	12 611	12 152
Ultimate analysis, dry basis:			
Carbon	%	68.91	65.67
Hydrogen	%	4.93	4.66
Sulphur	%	6.70	9.50
Nitrogen	%	0.90	0.92
Ash	%	15.97	17.72
Oxygen, by difference	%	2.59	1.53
Trace mercury	μg/g (ppm)	0.44	0.73
Ash fusibility temperature:			
Initial	°C	1055	1110
Spherical	°C	1095	1145
Hemispherical	°C	1210	1200
Fluid	°C	1215	1260
Hardgrove grindability index		60	59
Free swelling index		7.0	6.5

Notes:

N.B. COAL LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		5-12-78	
Sampling location		Wash Plant, Midlands	
Product name		Screen	Nut
Screen opening, mm		Plus 102, sq	64 x 19, sq
ERL number		2095-78	2096-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	4.82	7.58
Sulfate sulphur	%	0.05	0.14
Organic sulphur	%	1.83	1.78
Moisture (as rec'd):			
Inherent	%	0.80	0.76
Adherent	%	-	0.50
Ash analysis, %:			
SiO_2		36.26	25.15
Al_2O_3		11.01	9.47
Fe_2O_3		43.01	59.04
TiO_2		0.68	0.48
P_2O_5		1.63	0.97
CaO		3.73	2.15
MgO		0.56	0.47
SO_3		2.47	1.33
Na_2O		0.04	0.05
K_2O		0.54	0.79
SrO		-	-
BaO		-	-
LOF		-	-

Notes:

N.B. COAL LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		5-12-78	
Sampling location		Wash Plant, Midlands	
Product name		Stoker Pea	Fines
Screen opening, mm		19 x 6.4, sq	Minus 6.4, sq
ERL number		2097-79	2098-79
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	1.51	5.87
Ash	%	14.64	19.23
Volatile matter	%	33.32	30.49
Fixed carbon	%	50.53	44.41
Sulphur, as rec'd	%	7.83	7.18
Calorific value, as rec'd:			
	MJ/kg	25.63	25.07
	Btu/lb	12 728	11 201
Ultimate analysis, dry basis:			
Carbon	%	70.11	64.88
Hydrogen	%	4.95	4.64
Sulphur	%	7.95	7.63
Nitrogen	%	0.89	0.84
Ash	%	14.86	20.42
Oxygen, by difference	%	1.24	1.59
Trace mercury	µg/g (ppm)	0.49	0.47
Ash fusibility temperature:			
Initial	°C	1045	1075
Spherical	°C	1100	1120
Hemispherical	°C	1145	1195
Fluid	°C	1315	1200
Hardgrove grindability index		59	64
Free swelling index		7.5	6.5

Notes:

N.B. COAL LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	5-12-78	
Sampling location	Wash Plant, Midlands	
Product name	Stoker Pea	Fines
Screen opening, mm	19 x 6.4, sq	Minus 6.4, sq
ERL number	2097-79	2098-79
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	5.93	5.63
Sulfate sulphur .... %	0.08	0.37
Organic sulphur .... %	1.94	1.63
Moisture (as rec'd):		
Inherent .... %	0.81	1.38
Adherent .... %	0.70	4.49
Ash analysis, %:		
SiO_2	26.21	32.08
Al_2O_3	8.72	12.59
Fe_2O_3	55.80	40.98
TiO_2	0.49	0.54
P_2O_5	1.52	1.20
CaO	3.46	4.92
MgO	0.50	1.01
SO_3	2.47	4.90
Na_2O	0.12	0.07
K_2O	0.69	1.68
SrO	-	-
BaO	-	-
LOF	-	-

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		6-12-78	7-12-78
Sampling location		Grand Lake Power Station (NBEPC) Dragline 4500	
Product name		Mine Run	
Screen opening, mm			
ERL number		2099-79	2100-79
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	2.55	3.19
Ash	%	19.11	18.45
Volatile matter	%	31.37	31.33
Fixed carbon	%	46.97	47.03
Sulphur, as rec'd	%	8.14	8.60
Calorific value, as rec'd:			
	MJ/kg	27.67	27.28
	Btu/lb	11 895	11 729
Ultimate analysis, dry basis:			
Carbon	%	65.45	65.25
Hydrogen	%	4.64	4.41
Sulphur	%	8.36	8.88
Nitrogen	%	0.73	0.76
Ash	%	19.61	19.06
Oxygen, by difference	%	1.21	1.64
Trace mercury	μg/g (ppm)	0.71	0.88
Ash fusibility temperature:			
Initial	°C	1100	1120
Spherical	°C	1120	1140
Hemispherical	°C	1230	1245
Fluid	°C	1288	1290
Hardgrove grindability index		64	64
Free swelling index		6.0	6.0

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		6-12-78	7-12-78
Sampling location		Grand Lake Power Station (NBEPC) Dragline 4500	
Product name		Mine Run	
Screen opening, mm			
ERL number		2099-79	2100-79
Sulphur Forms (dry basis):			
Pyritic sulphur	%	6.58	7.27
Sulfate sulphur	%	0.10	0.35
Organic sulphur	%	1.68	1.26
Moisture (as rec'd):			
Inherent	%	0.58	1.09
Adherent	%	1.97	2.10
Ash analysis, %:			
SiO_2		30.69	26.73
Al_2O_3		12.16	10.79
Fe_2O_3		49.54	54.97
TiO_2		0.53	0.46
P_2O_5		1.07	0.84
CaO		2.41	2.14
MgO		0.74	0.88
SO_3		1.41	1.78
Na_2O		0.00	0.05
K_2O		1.30	1.36
SrO		-	-
BaO		-	-
LOF		-	-

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	21-8-79	22-8-79
Sampling location	Grand Lake Power Station (NBEPC) Dragline 4500	
Product name	Mine Run	
Screen opening, mm		
ERL number	3782-80	3783-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture %	3.82	4.02
Ash %	21.48	17.70
Volatile matter %	31.43	32.83
Fixed carbon %	43.27	45.45
Sulphur, as rec'd %	9.51	7.69
Calorific value, as rec'd:		
MJ/kg	25.69	27.20
Btu/lb	11 044	11 694
Ultimate analysis, dry basis:		
Carbon %	61.48	63.79
Hydrogen %	3.66	3.76
Sulphur %	9.89	8.01
Nitrogen %	0.79	0.63
Ash %	22.34	18.44
Oxygen, by difference %	1.84	5.37
Trace mercury µg/g (ppm)	0.95	0.21
Ash fusibility temperature:		
Initial °C	1000	1020
Spherical °C	1060	1065
Hemispherical °C	1075	1075
Fluid °C	1190	1180
Hardgrove grindability index	66	66
Free swelling index	4.0	4.0

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		21-8-79	22-8-79
Sampling location		Grand Lake Power Station (NBEPC) Dragline 4500	
Product name		Mine Run	
Screen opening, mm			
ERL number		3782-80	3783-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	8.22	5.81
Sulfate sulphur	%	0.61	0.60
Organic sulphur	%	1.06	1.60
Moisture (as rec'd):			
Inherent	%	1.60	1.97
Adherent	%	2.22	2.05
Ash analysis, %:			
SiO_2		21.61	29.68
Al_2O_3		8.13	10.04
Fe_2O_3		50.77	47.41
TiO_2		0.35	0.50
P_2O_5		0.50	1.26
CaO		6.96	4.19
MgO		0.00	0.54
SO_3		8.00	2.98
Na_2O		0.14	0.15
K_2O		0.93	0.89
SrO		0.00	0.00
BaO		0.08	0.07
LOF		0.54	0.38

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		24-8-79	2-10-80
Sampling location		Dragline 4500	Dragline 4500
Product name		Seam Sample	Seam Sample
Screen opening, mm			
ERL number		3784-80	4594-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	3.04	2.62
Ash	%	19.03	23.03
Volatile matter	%	32.67	31.70
Fixed carbon	%	45.26	42.65
Sulphur, as rec'd	%	10.84	8.09
Calorific value, as rec'd:			
	MJ/kg	26.40	26.13
	Btu/lb	11 349	11 234
Ultimate analysis, dry basis:			
Carbon	%	61.93	62.63
Hydrogen	%	3.70	4.30
Sulphur	%	11.18	8.31
Nitrogen	%	0.47	0.86
Ash	%	19.63	23.65
Oxygen, by difference	%	3.09	0.25
Trace mercury	µg/g (ppm)	1.23	0.82
Ash fusibility temperature:			
Initial	°C	1040	1060
Spherical	°C	1100	1105
Hemispherical	°C	1120	1132
Fluid	°C	1165	1200
Hardgrove grindability index		66	65
Free swelling index		3.5	6.0

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	24-8-79	2-10-80
Sampling location	Dragline 4500	Dragline 4500
Product name	Seam Sample	Seam Sample
Screen opening, mm		
ERL number	3784-80	4594-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	9.21	7.75
Sulfate sulphur .... %	0.85	0.04
Organic sulphur .... %	1.12	0.52
Moisture (as rec'd):		
Inherent .... %	1.60	0.88
Adherent .... %	1.44	1.74
Ash analysis, %:		
SiO_2	14.71	26.63
Al_2O_3	5.50	11.10
Fe_2O_3	66.27	38.75
TiO_2	0.29	0.37
P_2O_5	0.58	1.14
CaO	5.15	7.59
MgO	0.16	0.70
SO_3	4.93	3.37
Na_2O	0.12	0.09
K_2O	0.47	1.55
SrO	0.00	0.01
BaO	0.00	0.19
LOF	1.26	7.58

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		1-10-80	2-10-80
Sampling location		Grand Lake Power Station (NBEPC) Dragline 4500	
Product name		Mine Run	
Screen opening, mm			
ERL number		4595-80	4596-80
Rank of coal		High-volatile A bituminous	
Proximate analysis, as rec'd:			
Moisture	%	2.56	2.66
Ash	%	21.68	21.65
Volatile matter	%	32.08	32.48
Fixed carbon	%	43.68	43.21
Sulphur, as rec'd	%	7.80	7.77
Calorific value, as rec'd:			
	MJ/kg	26.86	26.73
	Btu/lb	11 548	11 491
Ultimate analysis, dry basis:			
Carbon	%	63.05	63.27
Hydrogen	%	4.30	4.29
Sulphur	%	8.00	7.98
Nitrogen	%	0.83	0.75
Ash	%	22.25	22.24
Oxygen, by difference	%	1.57	1.47
Trace mercury	µg/g (ppm)	0.61	0.65
Ash fusibility temperature:			
Initial	°C	1060	1060
Spherical	°C	1115	1149
Hemispherical	°C	1132	1121
Fluid	°C	1215	1215
Hardgrove grindability index		65	65
Free swelling index		6.5	6.0

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date		1-10-80	2-10-80
Sampling location		Grand Lake Power Station (NBEPC) Dragline 4500	
Product name		Mine Run	
Screen opening, mm			
ERL number		4595-80	4596-80
Sulphur Forms (dry basis):			
Pyritic sulphur	%	6.90	6.81
Sulfate sulphur	%	0.06	0.06
Organic sulphur	%	1.04	1.11
Moisture (as rec'd):			
Inherent	%	0.79	0.81
Adherent	%	1.77	1.85
Ash analysis, %:			
SiO_2		26.70	26.76
Al_2O_3		10.97	11.03
Fe_2O_3		38.84	38.65
TiO_2		0.42	0.40
P_2O_5		1.24	1.20
CaO		8.41	8.60
MgO		0.73	0.58
SO_3		3.86	3.71
Na_2O		0.10	0.09
K_2O		1.55	1.57
SrO		0.01	0.01
BaO		0.15	0.25
LOF		6.76	6.65

Notes:

KNOX CONSTRUCTION LIMITED
Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	23-8-79	3-10-80	3-10-80
Sampling location	Dragline 200W	Dragline 200W	Grand Lake Power Stn (NBEPC) Dragline 200W
Product name	Seam Sample	Seam Sample	Mine Run
Screen opening, mm			
ERL number	3787-80	4601-80	4602-80
Rank of coal	High-volatile A bituminous		
Proximate analysis, as rec'd:			
Moisture .... %	3.35	2.88	2.88
Ash .... %	24.71	16.29	17.28
Volatile matter .... %	28.51	31.81	31.64
Fixed carbon .... %	43.43	49.02	48.20
Sulphur, as rec'd .... %	11.59	7.16	7.68
Calorific value, as rec'd:			
MJ/kg	23.37	28.50	28.05
Btu/lb	10 044	12 254	12 061
Ultimate analysis, dry basis:			
Carbon .... %	54.77	68.45	67.06
Hydrogen .... %	3.12	4.46	4.34
Sulphur .... %	12.00	7.37	7.91
Nitrogen .... %	0.66	0.92	0.83
Ash .... %	25.56	16.77	17.79
Oxygen, by difference .... %	3.89	2.03	2.07
Trace mercury µg/g (ppm)	0.96	0.30	0.29
Ash fusibility temperature:			
Initial .... °C	1030	1049	1060
Spherical .... °C	1105	1060	1077
Hemispherical .... °C	1115	1065	1110
Fluid .... °C	1210	1177	1193
Hardgrove grindability index	60	61	61
Free swelling index	4.0	6.0	5.5

Notes:

KNOX CONSTRUCTION LIMITED

Dragline Operations; Minto/Chipman Area; Minto Coalfield
Minto, Sunbury/Queens Counties, New Brunswick

Sampling date	23-8-79	3-10-80	3-10-80
Sampling location	Dragline 200W	Dragline 200W	Grand Lake Power Stn (NBEPC) Dragline 200W
Product name	Seam Sample	Seam Sample	Mine Run
Screen opening, mm			
ERL number	3787-80	4601-80	4602-80
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	9.42	5.81	6.76
Sulfate sulphur .... %	1.03	0.08	0.08
Organic sulphur .... %	1.55	1.48	1.07
Moisture (as rec'd):			
Inherent .... %	2.02	1.08	1.10
Adherent .... %	1.33	1.80	1.78
Ash analysis, %:			
SiO_2	27.75	25.57	27.50
Al_2O_3	10.73	8.56	8.93
Fe_2O_3	56.64	48.20	47.05
TiO_2	0.56	0.40	0.41
P_2O_5	0.35	2.33	2.54
CaO	1.26	6.28	6.19
MgO	0.57	0.51	0.51
SO_3	1.06	3.14	3.56
Na_2O	0.13	0.11	0.12
K_2O	0.89	0.88	0.90
SrO	0.00	0.01	0.01
BaO	0.00	0.03	0.13
LOF	0.32	1.55	0.78

Notes:

R. MILLS COAL LIMITED

Coal Reclamation Project; Waste Dumps; Minto Coalfield
Midlands, Sunbury/Queens Counties, New Brunswick

Sampling date	3-10-80	30-9-80
Sampling location	Pilot Recovery Plant (Stockpile)	Grand Lake Power Station (NBEPC)
Product name	Fines	Fines
Screen opening, mm	Minus 6.4, sq	Minus 6.4, sq
ERL number	4597-80	4598-80
Rank of coal	High-volatile A bituminous	
Proximate analysis, as rec'd:		
Moisture %	8.87	16.37
Ash %	18.43	23.07
Volatile matter %	29.45	24.27
Fixed carbon %	43.25	36.29
Sulphur, as rec'd %	5.01	4.25
Calorific value, as rec'd:		
MJ/kg	25.09	20.61
Btu/lb	10 786	8862
Ultimate analysis, dry basis:		
Carbon %	63.26	58.09
Hydrogen %	4.45	3.97
Sulphur %	5.50	5.08
Nitrogen %	0.92	0.78
Ash %	20.22	27.59
Oxygen, by difference %	5.65	4.49
Trace mercury µg/g (ppm)	0.33	0.32
Ash fusibility temperature:		
Initial °C	1071	1071
Spherical °C	1149	1210
Hemispherical °C	1232	1265
Fluid °C	1304	1393
Hardgrove grindability index	-	-
Free swelling index	6.5	5.0

Notes: Fine coal is recovered on a pilot plant basis from settling pond sludge.

R. MILLS COAL LIMITED
Coal Reclamation Project; Waste Dumps; Minto Coalfield
Midlands, Sunbury/Queens Counties, New Brunswick

Sampling date	3-10-80	30-9-80
Sampling location	Pilot Recovery Plant (Stockpile)	Grand Lake Power Station (NBEPC)
Product name	Fines	Fines
Screen opening, mm	Minus 6.4, sq	Minus 6.4, sq
ERL number	4597-80	4598-80
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	3.75	3.55
Sulfate sulphur .... %	0.49	0.54
Organic sulphur .... %	1.26	0.99
Moisture (as rec'd):		
Inherent .... %	1.63	1.51
Adherent .... %	7.24	14.86
Ash analysis, %:		
SiO_2	43.78	49.95
Al_2O_3	15.77	17.08
Fe_2O_3	31.62	22.52
TiO_2	0.68	0.76
P_2O_5	0.98	0.71
CaO	1.22	1.49
MgO	0.79	0.76
SO_3	1.04	1.7
Na_2O	0.20	0.21
K_2O	2.45	2.85
SrO	0.01	0.01
BaO	0.14	0.13
LOF	0.00	0.36

Notes:

COAL ANALYSES - SASKATCHEWAN

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		24-9-79	27-9-78
Sampling location		Mine Screen Plant	
Product name		Pea	
Screen opening, mm		32 x 13	
ERL number		3796-79	3662-78
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture	%	40.41	34.41
Ash	%	7.83	9.40
Volatile matter	%	36.13	26.96
Fixed carbon	%	15.63	29.23
Sulphur, equil	%	0.42	0.48
Calorific value, equil:			
	MJ/kg	14.48	15.86
	Btu/lb	6225	6821
Ultimate analysis, dry basis:			
Carbon	%	65.95	65.30
Hydrogen	%	0.94	0.35
Sulphur	%	0.70	0.73
Nitrogen	%	1.23	1.14
Ash	%	13.15	14.33
Oxygen, by difference	%	18.03	18.15
Trace mercury	μg/g (ppm)	-	0.05
Ash fusibility temperature:			
Initial	°C	1125	1165
Spherical	°C	1225	1220
Hemispherical	°C	1250	1240
Fluid	°C	1290	1335
Hardgrove grindability index		46	-
Free swelling index		NA	NA

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		24-9-79	27-9-78
Sampling location		Mine Screen Plant	
Product name		Pea	
Screen opening, mm		32 x 13	
ERL number		3796-79	3662-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.20	0.29
Sulfate sulphur	%	0.05	0.02
Organic sulphur	%	0.45	0.42
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		34.91	37.88
Al_2O_3		19.87	21.22
Fe_2O_3		4.26	4.40
TiO_2		0.85	1.14
P_2O_5		0.47	0.37
CaO		15.90	15.82
MgO		3.69	3.92
SO_3		10.38	10.93
Na_2O		7.31	4.13
K_2O		0.24	0.22
SrO		0.53	-
BaO		0.55	-
LOF		0.71	-

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		24-9-79	27-9-78
Sampling location		Mine Screen Plant	
Product name		Slack	
Screen opening, mm		Minus 32	
ERL number		3795-79	3664-78
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture	%	37.97	34.60
Ash	%	9.37	11.77
Volatile matter	%	39.81	25.45
Fixed carbon	%	12.85	28.18
Sulphur, equil	%	0.49	0.60
Calorific value, equil:			
	MJ/kg	14.86	15.16
	Btu/lb	6388	6516
Ultimate analysis, dry basis:			
Carbon	%	67.37	65.81
Hydrogen	%	0.66	0.55
Sulphur	%	0.79	0.91
Nitrogen	%	0.75	1.14
Ash	%	15.11	17.99
Oxygen, by difference	%	15.32	13.60
Trace mercury	μg/g (ppm)	-	0.06
Ash fusibility temperature:			
Initial	°C	1105	1180
Spherical	°C	1205	1240
Hemispherical	°C	1225	1250
Fluid	°C	1320	1325
Hardgrove grindability index		63	56
Free swelling index		NA	NA

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		24-9-79	27-9-78
Sampling location		Mine Screen Plant	
Product name		Slack	
Screen opening, mm		Minus 32	
ERL number		3795-79	3664-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.28	0.55
Sulfate sulphur	%	0.14	0.07
Organic sulphur	%	0.37	0.29
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		36.72	41.58
Al_2O_3		20.10	20.76
Fe_2O_3		4.47	4.88
TiO_2		0.84	1.38
P_2O_5		0.39	0.27
CaO		14.07	13.53
MgO		3.04	3.74
SO_3		10.14	10.49
Na_2O		6.27	3.10
K_2O		0.21	0.29
SrO		0.25	-
BaO		0.78	-
LOF		0.66	-

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		25-9-79	26-9-78
Sampling location		Estevan Generating Station Saskatchewan Power Corp.	
Product name		Power Plant Feed	
Screen opening, mm		Minus 38	
ERL number		3801-79	3660-78
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture	%	42.84	33.44
Ash	%	6.31	10.50
Volatile matter	%	35.84	27.15
Fixed carbon	%	15.01	28.91
Sulphur, equil	%	0.35	0.59
Calorific value, equil:			
	MJ/kg	14.58	16.00
	Btu/lb	6267	6882
Ultimate analysis, dry basis:			
Carbon	%	68.06	81.14
Hydrogen	%	0.45	0.63
Sulphur	%	0.62	0.88
Nitrogen	%	1.21	1.18
Ash	%	11.05	15.77
Oxygen, by difference	%	18.61	0.40
Trace mercury	µg/g (ppm)	-	0.04
Ash fusibility temperature:			
Initial	°C	1105	1120
Spherical	°C	1205	1180
Hemispherical	°C	1215	1230
Fluid	°C	1225	1265
Hardgrove grindability index		37	50
Free swelling index		NA	NA

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	25-9-79	26-9-78
Sampling location	Estevan Generating Station Saskatchewan Power Corp.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 38	
ERL number	3801-79	3660-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	-	0.48
Sulfate sulphur .... %	-	0.06
Organic sulphur .... %	-	0.34
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	32.38	38.59
Al_2O_3	18.50	19.43
Fe_2O_3	5.15	5.98
TiO_2	0.54	1.25
P_2O_5	0.22	0.33
CaO	15.75	12.81
MgO	3.64	3.65
SO_3	10.30	12.38
Na_2O	9.93	5.12
K_2O	0.74	0.49
SrO	0.49	-
BaO	1.23	-
LOF	0.66	-

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		27-9-78
Sampling location		Mine Screen Plant
Product name		Booker
Screen opening, mm		51 x 32
ERL number		3661-78
Rank of coal		Lignite A
Proximate analysis, equil:		
Moisture	%	34.61
Ash	%	7.21
Volatile matter	%	26.87
Fixed carbon	%	31.31
Sulphur, equil	%	0.80
Calorific value, equil:		
	MJ/kg	16.57
	Btu/lb	7124
Ultimate analysis, dry basis:		
Carbon	%	69.98
Hydrogen	%	0.70
Sulphur	%	0.62
Nitrogen	%	1.23
Ash	%	11.03
Oxygen, by difference	%	16.44
Trace mercury	µg/g (ppm)	.04
Ash fusibility temperature:		
Initial	°C	1250
Spherical	°C	1255
Hemispherical	°C	1260
Fluid	°C	1370
Hardgrove grindability index		-
Free swelling index		NA

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	27-9-78
Sampling location	Mine Screen Plant
Product name	Booker
Screen opening, mm	51 x 32
ERL number	3661-78

Sulphur Forms (dry basis):		
Pyritic sulphur	%	0.17
Sulfate sulphur	%	0.02
Organic sulphur	%	0.43
Moisture (as rec'd):		
Inherent	%	-
Adherent	%	-

Ash analysis, %:	
SiO_2	31.43
Al_2O_3	20.07
Fe_2O_3	3.93
TiO_2	0.89
P_2O_5	0.63
CaO	20.08
MgO	6.01
SO_3	11.56
Na_2O	5.17
K_2O	0.23
SrO	-
BaO	-
LOF	-

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	24-9-79	27-9-78
Sampling location	Mine Screen Plant	
Product name	Slack	
Screen opening, mm	Minus 13	
ERL number	3797-79	3663-78
Rank of coal	Lignite A	
Proximate analysis, equil:		
Moisture %	32.98	32.78
Ash %	9.95	11.49
Volatile matter %	40.57	27.62
Fixed carbon %	16.50	28.11
Sulphur, equil %	0.45	0.56
Calorific value, equil:		
MJ/kg	15.87	15.73
Btu/lb	6824	6762
Ultimate analysis, dry basis:		
Carbon %	65.05	64.81
Hydrogen %	0.50	0.73
Sulphur %	0.67	0.84
Nitrogen %	1.24	1.19
Ash %	14.85	17.10
Oxygen, by difference %	17.69	15.23
Trace mercury µg/g (ppm)	-	0.08
Ash fusibility temperature:		
Initial °C	1095	1190
Spherical °C	1180	1245
Hemispherical °C	1225	1250
Fluid °C	1260	1400
Hardgrove grindability index	56	58
Free swelling index	NA	NA

Notes:

MANALTA COAL LIMITED
Klimax Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		24-9-79	27-9-78
Sampling location		Mine Screen Plant	
Product name		Slack	
Screen opening, mm		Minus 13	
ERL number		3797-79	3663-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.05	0.47
Sulfate sulphur	%	0.11	0.06
Organic sulphur	%	0.51	0.31
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		36.42	41.01
Al_2O_3		19.91	20.26
Fe_2O_3		3.84	4.90
TiO_2		0.75	1.48
P_2O_5		0.33	0.29
CaO		14.89	13.90
MgO		3.27	3.79
SO_3		10.10	11.06
Na_2O		6.86	3.05
K_2O		0.21	0.29
SrO		0.48	-
BaO		1.96	-
LOF		1.05	-

Notes:

UTILITY COALS (1978) LTD. (operator)
Utility Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date		25-10-79	26-10-78
Sampling location		Boundary Dam Generating Station Saskatchewan Power Corp.	
Product name		Power Plant Feed	
Screen opening, mm		Minus 38	
ERL number		3802-79	3656-78
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture	%	40.38	33.40
Ash	%	7.52	11.96
Volatile matter	%	33.57	25.56
Fixed carbon	%	18.53	29.08
Sulphur, equil	%	0.25	0.32
Calorific value, equil:			
	MJ/kg	14.64	15.41
	Btu/lb	6295	6625
Ultimate analysis, dry basis:			
Carbon	%	65.99	63.13
Hydrogen	%	0.59	0.92
Sulphur	%	0.42	0.78
Nitrogen	%	1.24	1.23
Ash	%	12.61	17.95
Oxygen, by difference	%	19.14	15.99
Trace mercury	μg/g (ppm)	-	0.06
Ash fusibility temperature:			
Initial	°C	1100	1140
Spherical	°C	1175	1180
Hemispherical	°C	1205	1200
Fluid	°C	1225	1305
Hardgrove grindability index		56	44
Free swelling index		NA	NA

Notes:

UTILITY COALS (1978) LTD. (operator)
Utility Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	25-10-79	26-10-78
Sampling location	Boundary Dam Generating Station Saskatchewan Power Corp.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 38	
ERL number	3802-79	3656-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	-	0.06
Sulfate sulphur .... %	-	0.07
Organic sulphur .... %	-	0.65
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	37.32	44.61
Al_2O_3	20.59	18.28
Fe_2O_3	3.80	5.23
TiO_2	0.66	1.13
P_2O_5	0.51	0.40
CaO	16.50	11.81
MgO	3.20	4.42
SO_3	6.65	9.07
Na_2O	7.36	4.17
K_2O	0.32	0.96
SrO	0.51	-
BaO	1.42	-
LOF	0.69	-

Notes:

BIENFAIT COAL COMPANY LTD. (operator)
Bienfait Mine; Taylorton & Estevan Seams; Ravenscrag Formation
Bienfait, Saskatchewan

Sampling date		24-10-79	
Sampling location		Mine Screen Plant	
Product name	Booker	Pea	Slack
Screen opening, mm	51 x 25	25 x 13	Minus 13
ERL number	3798-79	3799-79	3800-79
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture .... %	33.30	33.16	41.32
Ash .... %	7.59	8.26	8.41
Volatile matter .... %	34.74	40.75	35.87
Fixed carbon .... %	24.37	17.83	14.40
Sulphur, equil .... %	0.38	0.37	0.39
Calorific value, equil:			
MJ/kg	16.80	16.64	14.31
Btu/lb	7222	7154	6152
Ultimate analysis, dry basis:			
Carbon .... %	66.80	65.43	65.63
Hydrogen .... %	0.93	0.81	0.80
Sulphur .... %	0.57	0.55	0.66
Nitrogen .... %	1.26	1.20	1.26
Ash .... %	11.37	12.35	14.34
Oxygen, by difference .... %	19.07	19.65	17.32
Trace mercury μg/g (ppm)	-	-	-
Ash fusibility temperature:			
Initial .... °C	1115	1145	1140
Spherical .... °C	1195	1215	1215
Hemispherical .... °C	1205	1220	1225
Fluid .... °C	1220	1250	1315
Hardgrove grindability index	38	43	48
Free swelling index	NA	NA	NA

Notes:

BIENFAIT COAL COMPANY LTD. (operator)
Bienfait Mine; Taylorton & Estevan Seams; Ravenscrag Formation
Bienfait, Saskatchewan

Sampling date		24-10-79		
Sampling location		Mine Screen Plant		
Product name		Booker	Pea	Slack
Screen opening, mm		51 x 25	25 x 13	Minus 13
ERL number		3798-79	3799-79	3800-79
Sulphur Forms (dry basis):				
Pyritic sulphur	%	0.05	0.22	0.07
Sulfate sulphur	%	0.01	0.03	0.11
Organic sulphur	%	0.51	0.30	0.48
Moisture (as rec'd):				
Inherent	%	-	-	-
Adherent	%	-	-	-
Ash analysis, %:				
SiO_2		31.54	36.22	37.34
Al_2O_3		18.11	20.97	20.93
Fe_2O_3		5.34	4.57	4.33
TiO_2		0.73	0.97	0.79
P_2O_5		0.69	0.56	0.46
CaO		15.63	14.44	13.07
MgO		3.83	3.54	2.68
SO_3		11.31	7.87	8.73
Na_2O		9.87	7.85	7.43
K_2O		0.19	0.18	0.26
SrO		0.62	0.55	0.51
BaO		0.64	0.59	2.61
LOF		1.28	0.60	0.78

Notes:

BIENFAIT COAL COMPANY LTD. (operator)
Bienfait Mine; Taylorton & Estevan Seams; Ravenscrag Formation
Bienfait, Saskatchewan

Sampling date		25-10-78	25-10-78
Sampling location		Mine Crusher and Screen Plant	
Product name		Screen	Slack
Screen opening, mm		51 x 13	Minus 13
ERL number		3658-78	3659-78
Rank of coal		Lignite A	
Proximate analysis, equil:			
Moisture	%	33.93	32.25
Ash	%	6.71	8.29
Volatile matter	%	27.35	29.71
Fixed carbon	%	32.01	29.75
Sulphur, equil	%	0.34	0.43
Calorific value, equil:			
	MJ/kg	17.00	17.12
	Btu/lb	7308	8359
Ultimate analysis, dry basis:			
Carbon	%	69.17	70.25
Hydrogen	%	1.47	1.45
Sulphur	%	0.51	0.63
Nitrogen	%	1.23	1.32
Ash	%	10.16	12.24
Oxygen, by difference	%	17.46	14.11
Trace mercury	µg/g (ppm)	0.06	0.05
Ash fusibility temperature:			
Initial	°C	1145	1170
Spherical	°C	1225	1205
Hemispherical	°C	1250	1210
Fluid	°C	1260	1215
Hardgrove grindability index		46	50
Free swelling index		NA	NA

Notes:

BIENFAIT COAL COMPANY LTD. (operator)
Bienfait Mine; Taylorton & Estevan Seams; Ravenscrag Formation
Bienfait, Saskatchewan

Sampling date	25-10-78	25-10-78
Sampling location	Mine Crusher and Screen Plant	
Product name	Screen	Slack
Screen opening, mm	51 x 13	Minus 13
ERL number	3658-78	3659-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.11	0.13
Sulfate sulphur .... %	0.00	0.08
Organic sulphur .... %	0.40	0.42
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	28.89	32.64
Al_2O_3	16.10	16.60
Fe_2O_3	5.68	5.27
TiO_2	0.97	1.94
P_2O_5	0.99	0.77
CaO	18.01	15.75
MgO	4.68	3.96
SO_3	14.05	14.27
Na_2O	10.36	8.49
K_2O	0.30	0.33
SrO	-	-
BaO	-	-
LOF	-	-

Notes:

MANITOBA & SASKATCHEWAN COAL COMPANY LTD. (operator)
Boundary Dam Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	25-9-79	26-9-78
Sampling location	Boundary Dam Generating Station Saskatchewan Power Corp.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 38	
ERL number	3803-79	3657-78
Rank of coal	Lignite A	
Proximate analysis, equil:		
Moisture .... %	43.74	33.68
Ash .... %	9.01	14.02
Volatile matter .... %	32.56	24.77
Fixed carbon .... %	14.69	27.53
Sulphur, equil .... %	0.37	0.31
Calorific value, equil:		
MJ/kg	13.24	14.67
Btu/lb	5692	6307
Ultimate analysis, dry basis:		
Carbon .... %	63.44	60.28
Hydrogen .... %	0.56	0.37
Sulphur .... %	0.65	0.47
Nitrogen .... %	1.15	1.08
Ash .... %	16.02	21.13
Oxygen, by difference .... %	18.18	16.67
Trace mercury µg/g (ppm)	-	0.07
Ash fusibility temperature:		
Initial .... °C	1140	1160
Spherical .... °C	1205	1230
Hemispherical .... °C	1225	1290
Fluid .... °C	1290	1320
Hardgrove grindability index	51	38
Free swelling index	NA	NA

Notes:

MANITOBA & SASKATCHEWAN COAL COMPANY LTD. (operator)
Boundary Dam Mine; Estevan Seam; Ravenscrag Formation
Estevan, Saskatchewan

Sampling date	25-9-79	26-9-78
Sampling location	Boundary Dam Generating Station Saskatchewan Power Corp.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 38	
ERL number	3803-79	3657-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	-	0.18
Sulfate sulphur .... %	-	0.00
Organic sulphur .... %	-	0.29
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	41.26	51.55
Al_2O_3	20.32	20.72
Fe_2O_3	4.20	3.68
TiO_2	0.76	0.89
P_2O_5	0.60	0.31
CaO	12.92	8.69
MgO	3.11	2.50
SO_3	7.59	5.16
Na_2O	6.43	5.69
K_2O	0.48	0.88
SrO	0.46	-
BaO	1.18	-
LOF	0.55	-

Notes:

COAL ANALYSES - ALBERTA (Subbituminous)

CENTURY COALS LIMITED
Mine No. 1742 (Atlas); Drumheller Coalfield (CF26)
East Coulee, Drumheller Area, Plains Region, Alberta
Sec 6, Tp 27; R18, W4

Sampling date	17-10-78	17-10-78
Sampling location	Stockpile	Stockpile
Product name	Lump	Egg
Screen opening, mm	305 x 114, rd	114 x 51, rd
ERL number	3799-78	3800-78
Rank of coal	Subbituminous B	
Proximate analysis, equil:		
Moisture .... %	15.68	15.13
Ash .... %	6.48	10.06
Volatile matter .... %	32.72	32.06
Fixed carbon .... %	45.12	42.75
Sulphur, equil .... %	0.49	0.47
Calorific value, equil:		
MJ/kg	23.40	22.11
Btu/lb	10 060	9504
Ultimate analysis, dry basis:		
Carbon .... %	67.76	65.89
Hydrogen .... %	3.45	4.02
Sulphur .... %	0.59	0.56
Nitrogen .... %	1.76	1.70
Ash .... %	7.69	11.85
Oxygen, by difference .... %	18.75	15.95
Trace mercury μg/g (ppm)	0.05	0.05
Ash fusibility temperature:		
Initial .... °C	1150	1315
Spherical .... °C	1195	1345
Hemispherical .... °C	1245	1375
Fluid .... °C	1275	1400
Hardgrove grindability index	-	-
Free swelling index	NA	NA

Notes:

CENTURY COALS LIMITED
Mine No. 1742 (Atlas); Drumheller Coalfield (CF26)
East Coulee, Drumheller Area, Plains Region, Alberta
Sec 6, Twp 27; R18, W4

Sampling date		17-10-78	17-10-78
Sampling location		Stockpile	Stockpile
Product name		Lump	Egg
Screen opening, mm		305 x 114, rd	114 x 51, rd
ERL number		3799-78	3800-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.02	0.03
Sulfate sulphur	%	0.00	0.00
Organic sulphur	%	0.57	0.53
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		39.75	48.80
Al_2O_3		22.77	26.15
Fe_2O_3		4.09	2.94
TiO_2		0.95	0.76
P_2O_5		3.12	1.50
CaO		11.70	7.64
MgO		1.19	0.67
SO_3		9.13	5.30
Na_2O		6.53	4.87
K_2O		0.80	1.40
SrO		-	-
BaO		-	-
LOF		-	-

Notes:

CENTURY COALS LIMITED
Mine No. 1742 (Atlas); Drumheller Coalfield (CF26)
East Coulee, Drumheller Area, Plains Region, Alberta
Sec 6, Tp 27; R18, W4

Sampling date	17-10-78	17-10-78
Sampling location	Stockpile	Stockpile
Product name	Stoker	Slack
Screen opening, mm	41 x 16, rd	Minus 16, rd
ERL number	3801-78	3802-78
Rank of coal	Subbituminous B	
Proximate analysis, equil:		
Moisture .... %	17.36	17.65
Ash .... %	9.80	9.88
Volatile matter .... %	29.74	31.43
Fixed carbon .... %	43.10	41.04
Sulphur, equil .... %	0.47	0.47
Calorific value, equil:		
MJ/kg	21.45	21.18
Btu/lb	9222	9105
Ultimate analysis, dry basis:		
Carbon .... %	63.88	65.08
Hydrogen .... %	3.69	3.39
Sulphur .... %	0.57	0.57
Nitrogen .... %	1.70	1.77
Ash .... %	11.85	12.00
Oxygen, by difference .... %	18.31	17.19
Trace mercury μg/g (ppm)	0.04	0.03
Ash fusibility temperature:		
Initial .... °C	1315	1205
Spherical .... °C	1350	1370
Hemispherical .... °C	1460	1405
Fluid .... °C	1480+	1480+
Hardgrove grindability index	-	-
Free swelling index	NA	NA

Notes:

CENTURY COALS LIMITED
Mine No. 1742 (Atlas); Drumheller Coalfield (CF26)
East Coulee, Drumheller Area, Plains Region, Alberta
Sec 6, Tp 27; R18, W4

Sampling date	17-10-78	17-10-78
Sampling location	Stockpile	Stockpile
Product name	Stoker	Slack
Screen opening, mm	41 x 16, rd	Minus 16, rd
ERL number	3801-78	3802-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.05	0.06
Sulfate sulphur .... %	0.00	0.00
Organic sulphur .... %	0.52	0.51
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	48.49	48.43
Al_2O_3	26.00	26.53
Fe_2O_3	3.33	3.30
TiO_2	0.76	0.74
P_2O_5	1.48	1.30
CaO	7.81	7.73
MgO	1.00	1.21
SO_3	4.97	4.73
Na_2O	4.87	4.83
K_2O	1.36	1.22
SrO	-	-
BaO	-	-
LOF	-	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date		7-11-79	3-10-78
Sampling location		Forestburg Collieries Ltd.	
Product name		Lump	
Screen opening, mm		305 x 114	
ERL number		4047-79	3651-78
Rank of coal		Subbituminous C	
Proximate analysis, equil:			
Moisture	%	26.16	25.64
Ash	%	4.46	6.15
Volatile matter	%	35.12	30.28
Fixed carbon	%	34.26	37.93
Sulphur, equil	%	0.43	0.37
Calorific value, equil:			
	MJ/kg	20.27	19.93
	Btu/lb	8713	8567
Ultimate analysis, dry basis:			
Carbon	%	71.12	69.99
Hydrogen	%	2.54	2.37
Sulphur	%	0.59	0.50
Nitrogen	%	1.86	1.64
Ash	%	6.05	8.27
Oxygen, by difference	%	17.84	17.23
Trace mercury	µg/g (ppm)	-	0.05
Ash fusibility temperature:			
Initial	°C	1140	1250
Spherical	°C	1250	1293
Hemispherical	°C	1260	1315
Fluid	°C	1300	1370
Hardgrove grindability index		29	-
Free swelling index		NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	7-11-79	3-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Lump	
Screen opening, mm	305 x 114	
ERL number	4047-79	3651-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.04	0.03
Sulfate sulphur .... %	0.01	0.00
Organic sulphur .... %	0.54	0.47
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	27.44	38.54
Al_2O_3	16.77	21.96
Fe_2O_3	6.88	4.98
TiO_2	0.37	0.76
P_2O_5	1.16	0.88
CaO	22.63	18.59
MgO	3.29	2.70
SO_3	14.86	9.59
Na_2O	1.59	0.89
K_2O	0.28	1.17
SrO	0.42	-
BaO	0.81	-
LOF	2.55	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	7-11-79	3-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Egg	
Screen opening, mm	114 x 51	
ERL number	4048-79	3652-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	24.91	25.10
Ash .... %	5.35	5.33
Volatile matter .... %	35.07	30.36
Fixed carbon .... %	34.67	39.21
Sulphur, equil .... %	0.43	0.38
Calorific value, equil:		
MJ/kg	20.41	20.32
Btu/lb	8773	8736
Ultimate analysis, dry basis:		
Carbon .... %	71.31	73.87
Hydrogen .... %	2.72	2.39
Sulphur .... %	0.58	0.51
Nitrogen .... %	1.72	1.83
Ash .... %	7.12	7.12
Oxygen, by difference .... %	16.55	14.28
Trace mercury μg/g (ppm)	-	0.03
Ash fusibility temperature:		
Initial .... °C	1125	1190
Spherical .... °C	1225	1225
Hemispherical .... °C	1250	1255
Fluid .... °C	1305	1325
Hardgrove grindability index	30	-
Free swelling index	NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	7-11-79	3-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Egg	
Screen opening, mm	114 x 51	
ERL number	4048-79	3652-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.04	0.03
Sulfate sulphur .... %	0.01	0.00
Organic sulphur .... %	0.53	0.48
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	33.67	34.95
Al_2O_3	18.24	20.48
Fe_2O_3	5.80	5.67
TiO_2	0.34	0.76
P_2O_5	0.85	1.02
CaO	19.29	20.76
MgO	2.44	3.46
SO_3	12.16	11.34
Na_2O	1.71	0.78
K_2O	0.57	0.83
SrO	0.42	-
BaO	0.77	-
LOF	2.37	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	7-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Nut	
Screen opening, mm	51 x 38	
ERL number	4049-79	3653-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture %	25.53	26.23
Ash %	6.05	5.79
Volatile matter %	37.06	30.90
Fixed carbon %	31.36	37.08
Sulphur, equil %	0.42	0.37
Calorific value, equil:		
MJ/kg	20.01	19.87
Btu/lb	8601	8542
Ultimate analysis, dry basis:		
Carbon %	70.64	69.34
Hydrogen %	2.66	1.79
Sulphur %	0.56	0.50
Nitrogen %	1.86	1.70
Ash %	8.12	7.85
Oxygen, by difference %	16.16	18.82
Trace mercury µg/g (ppm)	-	0.03
Ash fusibility temperature:		
Initial °C	1140	1195
Spherical °C	1220	1260
Hemispherical °C	1330	1270
Fluid °C	1415	1345
Hardgrove grindability index	29	-
Free swelling index	NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	7-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Nut	
Screen opening, mm	51 x 38	
ERL number	4049-79	3653-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.05	0.03
Sulfate sulphur .... %	0.01	0.00
Organic sulphur .... %	0.50	0.47
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	35.67	37.36
Al_2O_3	18.65	20.70
Fe_2O_3	5.57	5.57
TiO_2	0.33	0.68
P_2O_5	0.83	1.02
CaO	18.56	19.33
MgO	2.59	2.88
SO_3	11.28	10.76
Na_2O	1.62	0.82
K_2O	0.60	0.92
SrO	0.41	-
BaO	0.76	-
LOF	2.31	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	8-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Stoker	
Screen opening, mm	38 x 13	
ERL number	4050-79	3654-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	25.73	25.42
Ash .... %	5.71	6.29
Volatile matter .... %	24.32	30.29
Fixed carbon .... %	32.24	38.00
Sulphur, equil .... %	0.43	0.37
Calorific value, equil:		
MJ/kg	20.14	19.91
Btu/lb	8659	8559
Ultimate analysis, dry basis:		
Carbon .... %	79.49	71.28
Hydrogen .... %	2.51	2.35
Sulphur .... %	0.58	0.51
Nitrogen .... %	1.84	1.70
Ash .... %	7.70	8.42
Oxygen, by difference .... %	16.88	15.74
Trace mercury μg/g (ppm)	-	0.03
Ash fusibility temperature:		
Initial .... °C	1145	1260
Spherical .... °C	1270	1295
Hemispherical .... °C	1290	1360
Fluid .... °C	1350	1380
Hardgrove grindability index	30	-
Free swelling index	NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	8-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Stoker	
Screen opening, mm	38 x 13	
ERL number	4050-79	3654-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.04	0.03
Sulfate sulphur .... %	0.00	0.00
Organic sulphur .... %	0.54	0.48
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	33.54	-
Al_2O_3	18.98	-
Fe_2O_3	6.18	-
TiO_2	0.41	-
P_2O_5	0.93	-
CaO	19.50	-
MgO	2.74	-
SO_3	11.94	-
Na_2O	1.61	-
K_2O	0.53	-
SrO	0.42	-
BaO	0.64	-
LOF	1.87	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	8-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Slack	
Screen opening, mm	Minus 13	
ERL number	4051-79	3655-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	25.18	25.17
Ash .... %	5.77	6.55
Volatile matter .... %	36.08	30.51
Fixed carbon .... %	32.97	37.77
Sulphur, equil .... %	0.46	0.42
Calorific value, equil:		
MJ/kg	20.35	19.90
Btu/lb	8766	8556
Ultimate analysis, dry basis:		
Carbon .... %	70.63	70.43
Hydrogen .... %	2.58	2.20
Sulphur .... %	0.61	0.57
Nitrogen .... %	1.70	1.75
Ash .... %	7.72	8.75
Oxygen, by difference .... %	16.76	16.30
Trace mercury μg/g (ppm)	-	0.02
Ash fusibility temperature:		
Initial .... °C	1150	1215
Spherical .... °C	1275	1300
Hemispherical .... °C	1295	1310
Fluid .... °C	1340	1415
Hardgrove grindability index	30	-
Free swelling index	NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	8-11-79	4-10-78
Sampling location	Forestburg Collieries Ltd.	
Product name	Slack	
Screen opening, mm	Minus 13	
ERL number	4051-79	3655-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.04	0.07
Sulfate sulphur .... %	0.01	0.01
Organic sulphur .... %	0.56	0.49
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	32.69	39.58
Al_2O_3	17.94	20.32
Fe_2O_3	6.52	5.72
TiO_2	0.27	0.81
P_2O_5	1.03	0.65
CaO	18.59	17.95
MgO	2.38	2.84
SO_3	12.68	10.47
Na_2O	1.88	0.84
K_2O	0.54	0.86
SrO	0.44	-
BaO	1.28	-
LOF	2.21	-

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date		8-11-79	4-10-78
Sampling location		Battle River Generating Station Alberta Power Ltd.	
Product name		Power Plant Feed	
Screen opening, mm		Minus 19	
ERL number		4046-79	3650-78
Rank of coal		Subbituminous C	
Proximate analysis, equil:			
Moisture	%	26.16	25.83
Ash	%	8.20	10.18
Volatile matter	%	36.50	29.18
Fixed carbon	%	29.14	34.81
Sulphur, equil	%	0.39	0.35
Calorific value, equil:			
	MJ/kg	18.48	18.28
	Btu/lb	7947	7858
Ultimate analysis, dry basis:			
Carbon	%	68.28	65.36
Hydrogen	%	2.18	2.01
Sulphur	%	0.53	0.47
Nitrogen	%	1.75	1.61
Ash	%	11.10	13.73
Oxygen, by difference	%	16.16	16.82
Trace mercury	µg/g (ppm)	-	0.03
Ash fusibility temperature:			
Initial	°C	1255	1310
Spherical	°C	1345	1350
Hemispherical	°C	1380	1375
Fluid	°C	1430	1475
Hardgrove grindability index		31	33
Free swelling index		NA	NA

Notes:

FORESTBURG COLLIERIES LIMITED (operator)
Mine No. 1578 (Diplomat); Seams 2 & 3; Battle River Coalfield (CF22)
Forestburg, Castor Area, Plains Region, Alberta
Sec 6, Tp 41; R15, W4

Sampling date	8-11-79	4-10-78
Sampling location	Battle River Generating Station Alberta Power Ltd.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 19	
ERL number	4046-79	3650-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.05	0.03
Sulfate sulphur .... %	0.01	0.00
Organic sulphur .... %	0.47	0.44
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-

Ash analysis, %:		
SiO_2	38.21	48.98
Al_2O_3	22.09	24.55
Fe_2O_3	4.98	3.83
TiO_2	0.30	0.52
P_2O_5	1.04	0.53
CaO	17.23	11.63
MgO	2.98	1.32
SO_3	8.47	6.32
Na_2O	0.55	0.99
K_2O	0.86	1.15
SrO	0.76	-
BaO	0.40	-
LOF	1.64	-

Notes:

MANALTA COAL LIMITED (operator)
Mine No. 1046 (Vesta); Battle River Coalfield (CF22)
Halkirk, Castor Area, Plains Region, Alberta
Sec 20, Tp 40; R15, W4

Sampling date	8-10-79	4-10-78
Sampling location	Battle River Generating Station Alberta Power Ltd.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 19	
ERL number	4045-79	3649-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	26.11	21.40
Ash .... %	8.21	9.14
Volatile matter .... %	39.63	29.94
Fixed carbon .... %	26.05	39.52
Sulphur, equil .... %	0.48	0.45
Calorific value, equil:		
MJ/kg	18.64	19.90
Btu/lb	8014	8556
Ultimate analysis, dry basis:		
Carbon .... %	73.20	63.73
Hydrogen .... %	2.57	3.02
Sulphur .... %	0.65	0.58
Nitrogen .... %	1.80	1.32
Ash .... %	11.11	11.63
Oxygen, by difference .... %	10.67	19.72
Trace mercury μg/g (ppm)	0.00	-
Ash fusibility temperature:		
Initial .... °C	1170	1150
Spherical .... °C	1310	1230
Hemispherical .... °C	1415	1280
Fluid .... °C	1450+	1315
Hardgrove grindability index	30	30
Free swelling index	NA	NA

Notes:

MANALTA COAL LIMITED (operator)
Mine No. 1046 (Vesta); Battle River Coalfield (CF22)
Halkirk, Castor Area, Plains Region, Alberta
Sec 20, Tp 40; R15, W4

Sampling date	8-10-79	4-10-78
Sampling location	Battle River Generating Station Alberta Power Ltd.	
Product name	Power Plant Feed	
Screen opening, mm	Minus 19	
ERL number	4045-79	3649-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.10	0.02
Sulfate sulphur .... %	0.02	0.01
Organic sulphur .... %	0.53	0.55
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	48.23	43.47
Al_2O_3	17.11	18.85
Fe_2O_3	8.31	8.07
TiO_2	0.44	0.66
P_2O_5	0.14	0.20
CaO	9.54	12.42
MgO	1.59	1.50
SO_3	7.86	10.85
Na_2O	1.76	2.46
K_2O	1.23	1.51
SrO	0.14	-
BaO	1.07	-
LOF	1.18	-

Notes:

MANALTA COAL LIMITED (operator)

Mine No. 1757 (Whitewood); Seams No. 1 & 3; Wabamun Coalfield (CF39)
Wabamun, Pembina Area, Plains Region, Alberta
Sec 29, Tp 52; R4, W5

Sampling date	9-8-79	20-9-78
Sampling location	Conveyor to Stockpile	
Product name	Power Plant Feed to Wabamun Generating Station of Calgary Power Ltd.	
Screen opening, mm	Minus 38, sq	Minus 38, sq
ERL number	3667-79	3665-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	21.28	20.15
Ash .... %	12.60	12.41
Volatile matter .... %	32.40	29.27
Fixed carbon .... %	33.72	38.17
Sulphur, equil .... %	0.22	0.18
Calorific value, equil:		
MJ/kg	18.56	19.13
Btu/lb	7981	8225
Ultimate analysis, dry basis:		
Carbon .... %	67.94	64.30
Hydrogen .... %	2.43	1.72
Sulphur .... %	0.28	0.23
Nitrogen .... %	1.31	0.88
Ash .... %	16.01	15.53
Oxygen, by difference .... %	12.03	17.34
Trace mercury μg/g (ppm)	0.00	0.05
Ash fusibility temperature:		
Initial .... °C	1275	1260
Spherical .... °C	1325	1315
Hemispherical .... °C	1415	1345
Fluid .... °C	1480+	1470
Hardgrove grindability index	42	46
Free swelling index	NA	NA

Notes:

MANALTA COAL LIMITED (operator)
Mine No. 1757 (Whitewood); Seams No. 1 & 3; Wabamun Coalfield (CF39)
Wabamun, Pembina Area, Plains Region, Alberta
Sec 29, Tp 52; R4, W5

Sampling date	9-8-79	20-9-78
Sampling location	Conveyor to Stockpile	
Product name	Power Plant Feed to Wabamun Generating Station of Calgary Power Ltd.	
Screen opening, mm	Minus 38, sq	Minus 38, sq
ERL number	3667-79	3665-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.11	0.08
Sulfate sulphur .... %	0.02	0.01
Organic sulphur .... %	0.15	0.14
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	54.95	53.02
Al_2O_3	19.73	22.45
Fe_2O_3	4.08	3.69
TiO_2	0.55	0.83
P_2O_5	-	0.22
CaO	12.48	13.16
MgO	2.10	2.24
SO_3	3.99	3.32
Na_2O	0.34	0.37
K_2O	0.78	0.73
SrO	0.09	-
BaO	0.32	-
LOF	0.56	-

Notes:

MANALTA COAL LIMITED (operator)
Mine No. 1769 (Highvale); No. 1, 2 & 3 Seams; Wabamun Coalfield (CF39)
Seba Beach, Pembina Area, Plains Region, Alberta
Sec 29, Tp 52; R4, W5

Sampling date		9-8-79	9-8-79
Sampling location		Conveyor to Stockpile (Seams No. 2 & 3)	Conveyor to Stockpile (Seam No. 1)
Product name		Feed to Sundance Generating Station of Calgary Power Ltd.	Feed to Sundance Generating Station of Calgary Power Ltd.
Screen opening, mm		Minus 38, sq	Minus 38, sq
ERL number		3666-79	3666-78
Rank of coal		Subbituminous C	Subbituminous C
Proximate analysis, equil:			
Moisture	%	25.72	21.85
Ash	%	11.22	14.02
Volatile matter	%	27.52	27.09
Fixed carbon	%	35.54	37.04
Sulphur, equil	%	0.14	0.17
Calorific value, equil:			
	MJ/kg	20.13	18.33
	Btu/lb	8655	7882
Ultimate analysis, dry basis:			
Carbon	%	67.02	62.92
Hydrogen	%	2.74	2.05
Sulphur	%	0.17	0.22
Nitrogen	%	1.26	0.80
Ash	%	15.11	17.94
Oxygen, by difference	%	13.70	16.07
Trace mercury	µg/g (ppm)	0.00	0.06
Ash fusibility temperature:			
Initial	°C	1070	1310
Spherical	°C	1330	1365
Hemispherical	°C	1370	1410
Fluid	°C	1480	1430
Hardgrove grindability index		44	55
Free swelling index		NA	NA

Notes:

MANALTA COAL LIMITED (operator)
Mine No. 1769 (Highvale); No. 1, 2 & 3 Seams, Wabamun Coalfield (CF39)
Seba Beach, Pembina Area, Plains Region, Alberta
Sec 29, Tp 52; R4, W5

Sampling date		9-8-79	9-8-79
Sampling location		Conveyor to Stockpile (Seams No. 2 & 3)	(Seam No. 1)
Product name		Feed to Sundance Generating Station of Calgary Power Ltd.	
Screen opening, mm		Minus 38, sq	
ERL number		3666-79	3666-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.06	0.08
Sulfate sulphur	%	0.00	0.00
Organic sulphur	%	0.11	0.14
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		47.20	52.19
Al_2O_3		24.85	24.81
Fe_2O_3		5.10	3.55
TiO_2		0.68	0.73
P_2O_5		0.16	0.08
CaO		13.49	11.24
MgO		0.85	0.94
SO_3		2.86	3.06
Na_2O		2.80	2.80
K_2O		0.65	0.65
SrO		0.13	-
BaO		0.60	-
LOF		0.06	-

Notes:

MANALTA COAL LIMITED
Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	18-10-78	18-10-78	18-10-78
Sampling location	Crushing and Screening Plant		
Product name	Lump	Egg	Nut
Screen opening, mm	Plus 114	114 x 51	51 x 32
ERL number	2803-78	3804-78	3805-78
Rank of coal	Subbituminous C		
Proximate analysis, as rec'd:			
Moisture .... %	21.74	21.15	23.00
Ash .... %	8.22	11.27	10.00
Volatile matter .... %	30.82	29.87	29.25
Fixed carbon .... %	39.22	37.71	37.75
Sulphur, equil .... %	0.39	0.42	0.46
Calorific value, equil:			
MJ/kg	20.17	19.39	19.26
Btu/lb	8673	8335	8281
Ultimate analysis, dry basis:			
Carbon .... %	63.98	66.90	61.41
Hydrogen .... %	3.72	1.67	2.56
Sulphur .... %	0.50	0.53	0.60
Nitrogen .... %	1.64	1.96	1.84
Ash .... %	10.50	14.30	12.99
Oxygen, by difference .... %	19.66	14.64	20.60
Trace mercury µg/g (ppm)	0.04	0.04	0.04
Ash fusibility temperature:			
Initial .... °C	1180	1260	1180
Spherical .... °C	1220	1350	1220
Hemispherical .... °C	1240	1380	1260
Fluid .... °C	1330	1400	1280
Hardgrove grindability index	26	29	28
Free swelling index	NA	NA	NA

Notes:

MANALTA COAL LIMITED

Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	18-10-78	18-10-78	18-10-78
Sampling location	Crushing and Screening Plant		
Product name	Lump	Egg	Nut
Screen opening, mm	Plus 114	114 x 51	51 x 32
ERL number	2803-78	3804-78	3805-78
Sulphur Forms (dry basis):			
Pyritic sulphur .... %	0.05	0.05	0.09
Sulfate sulphur .... %	0.00	0.00	0.01
Organic sulphur .... %	0.45	0.48	0.50
Moisture (as rec'd):			
Inherent .... %	-	-	-
Adherent .... %	-	-	-
Ash analysis, %:			
SiO_2	40.72	49.56	45.82
Al_2O_3	20.30	21.43	19.52
Fe_2O_3	9.34	5.57	7.83
TiO_2	0.62	0.65	0.81
P_2O_5	0.20	0.11	0.19
CaO	13.79	10.37	11.65
MgO	1.68	1.40	1.40
SO_3	9.15	6.88	8.75
Na_2O	2.90	2.12	2.44
K_2O	1.41	1.98	1.61
SrO	-	-	-
BaO	-	-	-
LOF	-	-	-

Notes:

MANALTA COAL LIMITED

Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	18-10-78	18-10-78
Sampling location	Crushing and Screening Plant	
Product name	Stoker	Slack
Screen opening, mm	32 x 14	Minus 14
ERL number	3806-78	3807-78
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	24.26	25.49
Ash .... %	9.49	11.83
Volatile matter .... %	28.68	28.44
Fixed carbon .... %	37.57	34.24
Sulphur, equil .... %	0.36	0.50
Calorific value, equil:		
MJ/kg	19.26	17.86
Btu/lb	8281	7677
Ultimate analysis, dry basis:		
Carbon .... %	61.06	57.75
Hydrogen .... %	3.19	2.90
Sulphur .... %	0.47	0.67
Nitrogen .... %	1.68	1.74
Ash .... %	12.53	15.88
Oxygen, by difference .... %	21.07	21.06
Trace mercury μg/g (ppm)	0.03	0.04
Ash fusibility temperature:		
Initial .... °C	1180	1205
Spherical .... °C	1260	1280
Hemispherical .... °C	1315	1305
Fluid .... °C	1395	1370
Hardgrove grindability index	-	-
Free swelling index	NA	NA

Notes:

MANALTA COAL LIMITED
Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	18-10-78	18-10-78
Sampling location	Crushing and Screening Plant	
Product name	Stoker	Slack
Screen opening, mm	32 x 14	Minus 14
ERL number	3806-78	3807-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.07	0.19
Sulfate sulphur .... %	0.01	0.06
Organic sulphur .... %	0.39	0.42
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	47.18	49.85
Al_2O_3	21.31	18.90
Fe_2O_3	4.72	7.36
TiO_2	0.71	1.18
P_2O_5	0.74	0.15
CaO	10.42	9.49
MgO	1.25	1.50
SO_3	7.37	7.88
Na_2O	5.42	2.13
K_2O	0.92	1.57
SrO	-	-
BaO	-	-
LOF	-	-

Notes:

MANALTA COAL LIMITED
Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date		5-11-79	5-11-79
Sampling location		Stockpile	Stockpile
Product name		Thermal Coal	Nut
Screen opening, mm		Minus 203	50 x 32
ERL number		4044-79	4041-79
Rank of coal		Subbituminous C	
Proximate analysis, equil:			
Moisture	%	24.27	26.37
Ash	%	17.53	7.55
Volatile matter	%	27.67	39.48
Fixed carbon	%	30.53	26.60
Sulphur, equil	%	0.86	0.43
Calorific value, equil:			
	MJ/kg	16.61	18.85
	Btu/lb	7142	8102
Ultimate analysis, dry basis:			
Carbon	%	56.81	68.24
Hydrogen	%	1.20	2.25
Sulphur	%	1.14	0.59
Nitrogen	%	1.27	1.64
Ash	%	23.15	10.25
Oxygen, by difference	%	16.43	17.03
Trace mercury	μg/g (ppm)	0.00	0.00
Ash fusibility temperature:			
Initial	°C	1160	1095
Spherical	°C	1350	1240
Hemispherical	°C	1390	1250
Fluid	°C	1445	1300
Hardgrove grindability index		34	28
Free swelling index		NA	NA

Notes:

MANALTA COAL LIMITED

Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	5-11-79	5-11-79
Sampling location	Stockpile	Stockpile
Product name	Thermal Coal	Nut
Screen opening, mm	Minus 203	50 x 32
ERL number	4044-79	4041-79
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.63	0.07
Sulfate sulphur .... %	0.05	0.00
Organic sulphur .... %	0.46	0.52
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	55.02	36.50
Al_2O_3	15.10	17.05
Fe_2O_3	11.59	11.03
TiO_2	0.34	0.47
P_2O_5	-	0.28
CaO	5.06	15.52
MgO	1.38	1.52
SO_3	4.98	9.86
Na_2O	3.20	2.43
K_2O	0.76	0.79
SrO	0.09	0.19
BaO	0.31	0.36
LOF	0.93	2.14

Notes:

MANALTA COAL LIMITED
Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	5-11-79	5-11-79
Sampling location	Stockpile	Stockpile
Product name	Stoker	Slack
Screen opening, mm	32 x 13, sq	Minus 13
ERL number	4042-79	4043-79
Rank of coal	Subbituminous C	
Proximate analysis, equil:		
Moisture .... %	26.49	24.83
Ash .... %	8.96	12.08
Volatile matter .... %	39.78	40.19
Fixed carbon .... %	24.77	22.90
Sulphur, equil .... %	0.43	0.54
Calorific value, equil:		
MJ/kg	18.59	17.88
Btu/lb	7993	7685
Ultimate analysis, dry basis:		
Carbon .... %	69.33	61.45
Hydrogen .... %	1.79	1.28
Sulphur .... %	0.58	0.72
Nitrogen .... %	1.26	1.56
Ash .... %	12.20	16.07
Oxygen, by difference .... %	14.84	18.92
Trace mercury μg/g (ppm)	0.00	0.00
Ash fusibility temperature:		
Initial .... °C	1155	1150
Spherical .... °C	1300	1310
Hemispherical .... °C	1310	1320
Fluid .... °C	1395	1345
Hardgrove grindability index	29	31
Free swelling index	NA	NA

Notes:

MANALTA COAL LIMITED

Mine No. 443 (Roselyn); No. 3 Seam; Sheerness Coalfield (CF37)
Sheerness, Sheerness Area, Plains Region, Alberta
Sec 13, Tp 29; R13, W4

Sampling date	5-11-79	5-11-79
Sampling location	Stockpile	Stockpile
Product name	Stoker	Slack
Screen opening, mm	32 x 13, sq	Minus 13
ERL number	4042-79	4043-79
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.07	0.16
Sulfate sulphur .... %	0.00	0.08
Organic sulphur .... %	0.51	0.48
Moisture (as rec'd):		
Inherent .... %	-	-
Adherent .... %	-	-
Ash analysis, %:		
SiO_2	43.66	40.33
Al_2O_3	17.55	17.90
Fe_2O_3	8.81	7.17
TiO_2	0.50	0.43
P_2O_5	0.15	0.46
CaO	12.74	14.39
MgO	1.51	2.60
SO_3	8.86	10.63
Na_2O	2.03	1.31
K_2O	1.07	0.82
SrO	0.17	0.25
BaO	0.28	0.79
LOF	2.04	2.04

Notes:

COAL ANALYSES - ALBERTA (Bituminous)

THE CANMORE MINES LIMITED

Mine No. 1775 (Riverside, Wilson No. 3 Mines); Cascade Coalfield (CF44)
Canmore, Cascade Area, Mountain Region, Alberta
Sec 1, Tp 24; R10, W5

Sampling date		6-9-78	6-9-78	6-9-78
Sampling location		Coal Preparation Plant		
Product name		Clean Coal	Cobble	Stoker
Screen opening, mm		Minus 32, sq	101 x 32, sq	32 x 6, sq
ERL number		3622-78	3623-78	3624-78
Rank of coal		Semi-anthracite		
Proximate analysis, as rec'd:				
Moisture	%	3.14	3.42	3.74
Ash	%	12.28	7.11	7.74
Volatile matter	%	11.19	11.47	11.41
Fixed carbon	%	73.39	78.00	77.11
Sulphur, as rec'd:	%	0.80	0.77	0.78
Calorific value, as rec'd:				
	MJ/kg	30.88	32.20	31.69
	Btu/lb	13 274	13 844	13 626
Ultimate analysis, dry basis:				
Carbon	%	79.12	84.98	85.39
Hydrogen	%	3.74	3.94	4.00
Sulphur	%	0.82	0.80	0.81
Nitrogen	%	1.48	1.43	1.42
Ash	%	12.68	7.36	8.04
Oxygen, by difference	%	2.16	1.49	0.34
Trace mercury	µg/g (ppm)	0.07	0.06	0.06
Ash fusibility temperature:				
Initial	°C	1370	1295	1360
Spherical	°C	1480+	1480+	1480+
Hemispherical	°C	1480+	1480+	1480+
Fluid	°C	1480+	1480+	1480+
Hardgrove grindability index		80	66	69
Free swelling index		NA	NA	NA

Notes:

THE CANMORE MINES LIMITED

Mine No. 1775 (Riverside, Wilson No. 3 Mines); Cascade Coalfield (CF44)
Canmore, Cascade Area, Mountain Region, Alberta
Sec 1, Tp 24; R10, W5

Sampling date	6-9-78	6-9-78	6-9-78
Sampling location		Coal Preparation Plant	
Product name	Clean Coal	Cobble	Stoker
Screen opening, mm	Minus 32, sq	101 x 32, sq	32 x 6, sq
ERL number	3622-78	3623-78	3624-78
Sulphur Forms (dry basis):			
Pyritic sulphur .... %			
Sulfate sulphur .... %			
Organic sulphur .... %			
Moisture (as rec'd):			
Inherent .... %			
Adherent .... %			
Ash analysis, %:			
SiO_2	62.65	55.31	59.20
Al_2O_3	26.03	28.05	28.30
Fe_2O_3	3.17	8.91	5.57
TiO_2	1.52	1.32	1.35
P_2O_5	1.11	0.97	1.06
CaO	1.14	1.54	1.11
MgO	0.70	1.05	0.67
SO_3	1.13	2.02	1.50
Na_2O	0.31	0.19	0.20
K_2O	2.35	0.70	1.12
SrO	-	-	-
BaO	-	-	-
LOF	-	-	-

Notes:

CARDINAL RIVER COALS LIMITED
Mine No. 1768 (Cardinal River); Jewell Seam; Mountain Park Coalfield (CF49)
Hinton, Mountain Park Area, Mountain Region, Alberta
Sec 15, 16, 22; Tp 47; R24, W5

Sampling date	25-8-79	26-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 38, rd	
ERL number	3665-79	3156-78
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.46	5.14
Ash .... %	8.88	8.77
Volatile matter .... %	19.86	25.06
Fixed carbon .... %	69.80	61.03
Sulphur, as rec'd: .... %	0.30	0.25
Calorific value, as rec'd:		
MJ/kg	32.10	30.77
Btu/lb	13 801	13 230
Ultimate analysis, dry basis:		
Carbon .... %	82.64	80.44
Hydrogen .... %	4.57	4.67
Sulphur .... %	0.30	0.26
Nitrogen .... %	1.39	1.10
Ash .... %	9.01	9.25
Oxygen, by difference .... %	2.09	4.28
Trace mercury μg/g (ppm)	0.00	0.10
Ash fusibility temperature:		
Initial .... °C	1175	1325
Spherical .... °C	1325	1405
Hemispherical .... °C	1380	1480+
Fluid .... °C	1435	1480+
Hardgrove grindability index	84	-
Free swelling index	3.0	7.5

Notes:

CARDINAL RIVER COALS LIMITED

Mine No. 1768 (Cardinal River); Jewell Seam; Mountain Park Coalfield (CF49)
Hinton, Mountain Park Area, Mountain Region, Alberta
Sec 15, 16, 22; Tp 47; R24, W5

Sampling date	25-8-79	26-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 38, rd	
ERL number	3665-79	3156-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.07	
Sulfate sulphur .... %	0.01	
Organic sulphur .... %	0.22	
Moisture (as rec'd):		
Inherent .... %	-	
Adherent .... %	-	
Ash analysis, %:		
SiO_2	47.81	52.81
Al_2O_3	24.83	26.50
Fe_2O_3	4.81	3.89
TiO_2	0.76	1.39
P_2O_5	0.36	0.79
CaO	7.33	6.30
MgO	2.15	1.97
SO_3	5.24	4.55
Na_2O	1.45	1.48
K_2O	0.35	0.32
SrO	0.15	-
BaO	0.64	-
LOF	3.77	-

Notes:

COLEMAN COLLIERIES LIMITED
Mine No. 1695 (Tent Mountain); Mine No. 1747; Vicary Creek
Tent Mountain Coalfield (CF56)
Coleman, Crowsnest Area, Mountain Region, Alberta
Sec 12, Tp 7; R6, W6

Sampling date	20-6-79	6-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 55, rd	
ERL number	3669-79	3155-78
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.62	6.70
Ash .... %	12.42	11.31
Volatile matter .... %	23.57	22.11
Fixed carbon .... %	62.39	59.88
Sulphur, as rec'd: .... %	0.45	0.33
Calorific value, as rec'd:		
MJ/kg	30.36	29.00
Btu/lb	13 055	12 470
Ultimate analysis, dry basis:		
Carbon .... %	77.07	77.30
Hydrogen .... %	4.50	4.35
Sulphur .... %	0.46	0.35
Nitrogen .... %	1.15	1.04
Ash .... %	12.62	12.12
Oxygen, by difference .... %	4.20	4.84
Trace mercury μg/g (ppm)	0.00	0.07
Ash fusibility temperature:		
Initial .... °C	1480+	1480+
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	79	-
Free swelling index	3	4

Notes:

COLEMAN COLLIERIES LIMITED

Mine No. 1695 (Tent Mountain); Mine No. 1747; Vicary Creek
Tent Mountain Coalfield (CF56)
Coleman, Crowsnest Area, Mountain Region, Alberta
Sec 12, Tp 7; R6, W6

Sampling date	20-6-79	6-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 55, rd	
ERL number	3669-79	3155-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.05	
Sulfate sulphur .... %	0.00	
Organic sulphur .... %	0.41	
Moisture (as rec'd):		
Inherent .... %	-	
Adherent .... %	-	
Ash analysis, %:		
SiO_2	55.72	55.57
Al_2O_3	32.36	30.32
Fe_2O_3	2.58	2.57
TiO_2	1.78	2.39
P_2O_5	0.53	1.79
CaO	2.68	2.98
MgO	0.72	1.30
SO_3	1.57	2.23
Na_2O	0.19	0.27
K_2O	0.91	0.58
SrO	0.11	-
BaO	0.65	-
LOF	0.64	-

Notes:

McINTYRE MINES LIMITED
Mines No. 1765 & 1771 (Smoky River); No. 4 & 11 Seams;
Smoky River Coalfield (CF55), Grande Cache, Smoky River Area,
Mountain Region, Alberta

Sampling date	24-8-79	28-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal	Clean Coal
Screen opening, mm	Minus 38, rd	
ERL number	3664-79	3154-78
Rank of coal	Low-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.10	4.22
Ash .... %	7.33	7.15
Volatile matter .... %	18.41	19.42
Fixed carbon .... %	73.18	69.21
Sulphur, as rec'd: .... %	0.43	0.42
Calorific value, as rec'd:		
MJ/kg	33.35	32.24
Btu/lb	14 337	13 860
Ultimate analysis, dry basis:		
Carbon .... %	84.59	83.30
Hydrogen .... %	4.67	4.41
Sulphur .... %	0.43	0.44
Nitrogen .... %	1.28	1.09
Ash .... %	7.41	7.47
Oxygen, by difference .... %	1.62	3.29
Trace mercury µg/g (ppm)	-	0.10
Ash fusibility temperature:		
Initial .... °C	1450	1480+
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	89	-
Free swelling index	5.0	8.0

Notes:

McINTYRE MINES LIMITED
Mines No. 1765 & 1771 (Smoky River); No. 4 & 11 Seams;
Smoky River Coalfield (CF55), Grande Cache, Smoky River Area,
Mountain Region, Alberta

Sampling date	24-8-79	28-6-78
Sampling location	Coal Preparation Plant	
Product name	Clean Coal	Clean Coal
Screen opening, mm	Minus 38, rd	
ERL number	3664-79	3154-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.07	
Sulfate sulphur .... %	0.00	
Organic sulphur .... %	0.36	
Moisture (as rec'd):		
Inherent .... %	-	
Adherent .... %	-	
Ash analysis, %:		
SiO_2	51.27	54.42
Al_2O_3	25.72	31.07
Fe_2O_3	4.11	3.88
TiO_2	1.24	1.94
P_2O_5	1.41	1.56
CaO	3.77	3.34
MgO	0.44	0.19
SO_3	1.93	1.73
Na_2O	1.14	1.13
K_2O	0.52	0.74
SrO	0.29	-
BaO	0.67	-
LOF	-	-

Notes:

LUSCAR STERCO (1977) LTD.
Mine No. 1778 (Coal Valley Mine); Weldwood Pit; Coalspur Coal Field (CF-57)
Foothills Region, Alberta
Tp 21; R21; W4

Sampling date		3 & 4-7-79
Sampling location		Coal Valley Plant
Product name		Clean Coal
Screen opening, mm		Minus 51, sq
ERL number		3794-79
Rank of coal		High-volatile C bituminous
Proximate analysis, equil:		
Moisture	%	8.16
Ash	%	10.33
Volatile matter	%	27.48
Fixed carbon	%	54.03
Sulphur, equil:	%	0.31
Calorific value, equil:		
	MJ/kg	24.75
	Btu/lb	10 639
Ultimate analysis, dry basis:		
Carbon	%	69.44
Hydrogen	%	3.08
Sulphur	%	0.34
Nitrogen	%	0.79
Ash	%	11.25
Oxygen, by difference	%	15.10
Trace mercury	μg/g (ppm)	0.02
Ash fusibility temperature:		
Initial	°C	1100
Spherical	°C	1220
Hemispherical	°C	1320
Fluid	°C	1330
Hardgrove grindability index		44
Free swelling index		N/A

Notes:

LUSCAR STERCO (1977) LTD.
Mine No. 1778 (Coal Valley Mine); Weldwood Pit; Coalspur Coal Field (CF-57)
Foothills Region, Alberta
Tp 21; R21; W4

Sampling date	3 & 4-7-79
Sampling location	Coal Valley Plant
Product name	Clean Coal
Screen opening, mm	Minus 51, sq
ERL number	3794-79
Sulphur Forms (dry basis):	
Pyritic sulphur .... %	0.11
Sulfate sulphur .... %	0.01
Organic sulphur .... %	0.22
Moisture (as rec'd):	
Inherent .... %	-
Adherent .... %	-
Ash analysis, %:	
SiO_2	49.79
Al_2O_3	17.60
Fe_2O_3	4.89
TiO_2	0.57
P_2O_5	0.31
CaO	13.44
MgO	1.94
SO_3	5.00
Na_2O	3.13
K_2O	0.65
SrO	0.25
BaO	0.78
LOF	0.66

Notes:

COAL ANALYSES - BRITISH COLUMBIA

BYRON CREEK COLLIERIES LIMITED
Corbin Mine; Mammoth Seam; Crowsnest Coalfield
Corbin, Kootenay Mining District, British Columbia

Sampling date	18-6-79	16-8-78
Sampling location	Automatic Sampler At Wash Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 51	
ERL number	3668-79	3431-78
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.23	2.24
Ash .... %	14.18	14.91
Volatile matter .... %	22.77	23.81
Fixed carbon .... %	61.82	59.04
Sulphur, as rec'd: .... %	0.17	0.29
Calorific value, as rec'd:		
MJ/kg	29.68	29.04
Btu/lb	12 760	12 486
Ultimate analysis, dry basis:		
Carbon .... %	75.42	73.45
Hydrogen .... %	4.33	4.16
Sulphur .... %	0.17	0.30
Nitrogen .... %	1.30	1.09
Ash .... %	14.36	15.25
Oxygen, by difference .... %	4.42	5.75
Trace mercury µg/g (ppm)	0.00	-
Ash fusibility temperature:		
Initial .... °C	1405	1375
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	70	74
Free swelling index	1.5	1.0

Notes:

BYRON CREEK COLLIERIES LIMITED
Corbin Mine; Mammoth Seam; Crowsnest Coalfield
Corbin, Kootenay Mining District, British Columbia

Sampling date	18-6-79	16-8-78
Sampling location	Automatic Sampler At Wash Plant	
Product name	Clean Coal Product	
Screen opening, mm	Minus 51	
ERL number	3668-79	3431-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %	0.11	
Sulfate sulphur .... %	0.02	
Organic sulphur .... %	0.04	
Moisture (as rec'd):		
Inherent .... %	-	
Adherent .... %	-	

Ash analysis, %:		
SiO_2	51.82	49.25
Al_2O_3	29.66	31.99
Fe_2O_3	3.79	2.45
TiO_2	1.56	2.06
P_2O_5	0.25	0.63
CaO	4.97	6.45
MgO	1.23	1.72
SO_3	4.17	3.77
Na_2O	0.69	1.19
K_2O	0.35	0.66
SrO	0.13	-
BaO	0.55	-
LOF	1.20	-

Notes:

FORDING COAL LIMITED
Greenhills, Clode & Taylor Pits; Elk Valley Coalfield
Elkford, East Kootenay District, British Columbia

Sampling date	19-6-79	31-5-78
Sampling location	Automatic Train (Composite of 5 trains)	Sampler (Composite of 6 trains)
Product name	Clean Coal Product	
Screen opening, mm	Minus 38, rd	
ERL number	3673-79	3153-78
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	1.37	8.83
Ash .... %	9.65	9.31
Volatile matter .... %	23.27	19.81
Fixed carbon .... %	65.71	62.05
Sulphur, as rec'd: .... %	0.40	0.36
Calorific value, as rec'd:		
MJ/kg	31.78	29.38
Btu/lb	13 664	12 630
Ultimate analysis, dry basis:		
Carbon .... %	81.17	80.65
Hydrogen .... %	4.81	4.35
Sulphur .... %	0.41	0.40
Nitrogen .... %	1.35	1.09
Ash .... %	9.78	10.21
Oxygen, by difference .... %	2.48	3.30
Trace mercury µg/g (ppm)	0.00	0.06
Ash fusibility temperature:		
Initial .... °C	1480+	1480+
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	95	-
Free swelling index	5	8

Notes:

FORDING COAL LIMITED
Greenhills, Clode & Taylor Pits; Elk Valley Coalfield
Elkford, East Kootenay District, British Columbia

Sampling date		19-6-79	31-5-78
Sampling location		Automatic Train (Composite of 5 trains)	Sampler (Composite of 6 trains)
Product name		Clean Coal Product	
Screen opening, mm		Minus 38, rd	
ERL number		3673-79	3153-78
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.07	
Sulfate sulphur	%	0.00	
Organic sulphur	%	0.34	
Moisture (as rec'd):			
Inherent	%	-	
Adherent	%	-	
Ash analysis, %:			
SiO_2			59.51
Al_2O_3			30.66
Fe_2O_3			3.77
TiO_2			1.85
P_2O_5			1.09
CaO			1.31
MgO			0.41
SO_3			0.39
Na_2O			0.06
K_2O			0.95
SrO			-
BaO			-
LOF			-

Notes:

KAISER RESOURCES LIMITED

Harmer Ridge Mine & Michel Colliery; Balmer Seam; Crowsnest Coalfield
Sparwood, East Kootenay District, British Columbia

Sampling date	10-6-78	10-6-78
Sampling location	Elkview Coal Preparation Plant	
Product name	Clean Coal	Oxidized Coal
Screen opening, mm	Minus 38, sq	Minus 13, sq
ERL number	3151-78	3152-78
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	6.88	5.52
Ash .... %	9.36	13.67
Volatile matter .... %	18.99	20.06
Fixed carbon .... %	64.77	60.75
Sulphur, as rec'd: .... %	0.32	0.26
Calorific value, as rec'd:		
MJ/kg	30.80	28.21
Btu/lb	13 240	12 130
Ultimate analysis, dry basis:		
Carbon .... %	81.29	75.34
Hydrogen .... %	4.50	3.86
Sulphur .... %	0.34	0.28
Nitrogen .... %	1.18	1.12
Ash .... %	10.05	14.47
Oxygen, by difference .... %	2.64	4.93
Trace mercury µg/g (ppm)	0.06	0.07
Ash fusibility temperature:		
Initial .... °C	1400	1480+
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	-	-
Free swelling index	7.5	7.5

Notes:

KAISER RESOURCES LIMITED
Harmer Ridge Mine & Michel Colliery; Balmer Seam; Crowsnest Coalfield
Sparwood, East Kootenay District, British Columbia

Sampling date	10-6-78	10-6-78
Sampling location	Elkview Coal Preparation Plant	
Product name	Clean Coal	Oxidized Coal
Screen opening, mm	Minus 38, sq	Minus 13, sq
ERL number	3151-78	3152-78
Sulphur Forms (dry basis):		
Pyritic sulphur .... %		
Sulfate sulphur .... %		
Organic sulphur .... %		
Moisture (as rec'd):		
Inherent .... %		
Adherent .... %		
Ash analysis, %:		
SiO_2	64.75	62.96
Al_2O_3	26.71	30.85
Fe_2O_3	2.15	0.98
TiO_2	1.74	1.73
P_2O_5	1.09	0.45
CaO	1.75	1.30
MgO	0.70	0.26
SO_3	0.70	0.65
Na_2O	0.05	0.05
K_2O	0.36	0.77
SrO	-	-
BaO	-	-
LOF	-	-

Notes:

KAISER RESOURCES LIMITED

Harmer Ridge Mine & Michel Colliery; Balmer Seam; Crowsnest Coalfield
Sparwood, East Kootenay District, British Columbia

Sampling date	12-6-79	15-6-78
Sampling location	Elkview Preparation Plant	Composite of 8 train cars
Product name	Clean Coal	Oxidized Coal
Screen opening, mm	Minus 38, sq	Minus 13, sq
ERL number	3670-79	3672-79
Rank of coal	Medium-volatile bituminous	
Proximate analysis, as rec'd:		
Moisture .... %	0.98	3.93
Ash .... %	9.53	15.85
Volatile matter .... %	21.05	19.79
Fixed carbon .... %	68.44	60.43
Sulphur, as rec'd: .... %	0.31	0.30
Calorific value, as rec'd:		
MJ/kg	32.20	28.31
Btu/lb	13 846	12 173
Ultimate analysis, dry basis:		
Carbon .... %	81.43	73.32
Hydrogen .... %	4.79	3.76
Sulphur .... %	0.31	0.31
Nitrogen .... %	1.23	1.26
Ash .... %	9.62	16.50
Oxygen, by difference .... %	2.62	4.85
Trace mercury μg/g (ppm)	0.00	0.00
Ash fusibility temperature:		
Initial .... °C	1400+	1480+
Spherical .... °C	1480+	1400+
Hemispherical .... °C	1480+	1480+
Fluid .... °C	1480+	1480+
Hardgrove grindability index	89	98
Free swelling index	4.0	-

Notes:

KAISER RESOURCES LIMITED
Harmer Ridge Mine & Michel Colliery; Balmer Seam; Crowsnest Coalfield
Sparwood, East Kootenay District, British Columbia

Sampling date		12-6-79	15-6-78
Sampling location		Elkview Preparation Plant	Composite of 8 train cars
Product name		Clean Coal	Oxidized Coal
Screen opening, mm		Minus 38, sq	Minus 13, sq
ERL number		3670-79	3672-79
Sulphur Forms (dry basis):			
Pyritic sulphur	%	0.04	0.07
Sulfate sulphur	%	0.00	0.00
Organic sulphur	%	0.27	0.24
Moisture (as rec'd):			
Inherent	%	-	-
Adherent	%	-	-
Ash analysis, %:			
SiO_2		62.45	56.57
Al_2O_3		27.22	29.16
Fe_2O_3		3.31	5.62
TiO_2		1.58	1.73
P_2O_5		0.62	0.97
CaO		2.07	1.89
MgO		0.44	0.70
SO_3		0.77	0.53
Na_2O		0.07	0.05
K_2O		0.47	0.95
SrO		0.03	0.08
BaO		0.23	0.18
LOF		-	0.44

Notes:

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Table 1 - Summary classification of coal by rank

VM*	FC*	Class	Group(rank)	Calorific value**	
%	%			Btu/lb	MJ/kg
2	98 -	Anthracitic(1)	Meta - Anthracite		
8	92 -		Anthracite		
14	86		Semianthracite		
		Bituminous(2)	Low-volatile bituminous		
22	78 -				
			Medium-volatile bituminous		
31	69 -		High-volatile A bituminous	14 000	32.6
			High-volatile B bituminous	13 000	30.2
			High-volatile C bituminous	11 500	26.7
		Subbituminous(4)	Subbituminous A(3)	10 500	24.4
			Subbituminous B	9 500	22.1
			Subbituminous C	8 300	19.3
		Lignite(4)	Lignite A	6 300	14.7
			Lignite B		

* Dry, mineral-matter-free basis; VM = Volatile matter; FC = Fixed carbon.

** Moist, mineral-matter-free basis.

(1) Nonagglomerating; if agglomerating, classified as low-volatile bituminous.

(2) Commonly agglomerating.

(3) If agglomerating, classified as high-volatile C bituminous.

(4) Nonagglomerating.

Table 2 - Mines sampled and approximate raw coal production for 1978-1981
(In thousands of tonnes)

	1978	1979	1980	1981
NOVA SCOTIA				
Sydney Coalfield				
Cape Breton Development Corporation (CBDC):				
- Lingan Mine (u/g)	1777	1492	1690	1510
- No. 26 Colliery (u/g)	800	731	999	718
- Prince Mine (u/g)	170	162	219	471
Novaco (Point Aconi) (strip)			55	184
Thomas Brogan Limited (strip)	47	41	69	57
Inverness Coalfield				
Evans Coal Mines Limited (u/g)	33	31	41	36
Pictou Coalfield				
Thorburn Mining Limited (reclamation)	40	42	44	27
Joggins Coalfield				
River Hébert Coal Company Limited (u/g)	22	22		
NEW BRUNSWICK				
Minto Coalfield				
N.B. Coal Limited (strip)	315	310	439	518
SASKATCHEWAN				
Estevan Area				
Manalta Coal Limited				
- Klimax Mine (strip)	674	559	714	738
Utility Coals (1978) Ltd.	1893	2102	2440	2397
Manitoba & Saskatchewan Coal Company Ltd.				
- Boundary Dam Mines (strip)	1700	1678	1689	1422
- Bienfait (strip)	448	342	537	1141
Saskatchewan Power Corporation				
- Souris Valley Coal Mine (strip)	344	331	304	302
- Poplar River Mine, Coronach (strip)			285	798

Table 2 cont'd

	1978	1979	1980	1981
ALBERTA				
Plains Region				
Forestburg Collieries Ltd.				
- Diplomat Mine, No. 1578 (strip)	922	685	815	1038
Manalta Coal Ltd.				
- Vesta Mine, No. 1046 (strip)	513	811	925	1110
- Whitewood Mine, No. 1757 (strip)	1329	1769	2195	1447
- Highvale Mine, No. 1769 (strip)	4969	6041	6469	7832
- Roselyn Mine, No. 443 (strip)	438	167	76	69
Mountain Region				
Cardinal River Coals Ltd.				
- Cardinal River Mine, No. 1768 (strip)	2472	1918	2942	1501
Coleman Collieries Limited				
- Tent Mountain, Mine No. 1695 (strip)	1020	1162	865	-
- Vicary Creek, Mine No. 1747 (u/g)	348	91		
McIntyre Mines Limited				
- Smoky River Mines, Grand Cache	1266	1156	1082	3205
(strip-u/g)	907	750	1325	
The Canmore Mines Limited				
- Mine No. 1775 (u/g)	122	56		
Luscar Sterco Ltd.				
- Coal Valley Mine (strip)	1242	3227	4256	4974
BRITISH COLUMBIA				
Crowsnest Coalfield				
Byron Creek Collieries Limited (strip)	536	893	1062	530
Kaiser Resources Limited				
- Harmer Ridge (strip)	6600	8288	5966	9051
- Michel Colliery (u/g)	796		703	
Elk Valley Coalfield				
Fording Coal Limited (strip)	4300	4758	5573	5825

Table 3 - Statistical summary of Canadian commercial coals

		Ash*	Total sulphur	Pyritic sulphur	Sulphate sulphur	Organic sulphur
NOVA SCOTIA						
Inverness Coalfield (High-volatile B bituminous)						
Evans Coal Mines Limited	No. of samples	17	17	6	6	6
	$\bar{x}$	11.09	6.73	3.19	0.16	3.37
	S	2.40	0.45	0.43	0.17	0.26
	S_x	0.58	0.11	0.18	0.07	0.11
NEW BRUNSWICK						
Minto Coalfield (High-volatile A bituminous)						
N.B. Coal Limited	No. of samples	28	28	28	28	28
and Knox Construction Limited	$\bar{x}$	19.68	8.54	6.99	0.28	1.28
	S	3.37	1.41	1.17	0.30	0.29
	S_x	0.64	0.27	0.22	0.06	0.05
SASKATCHEWAN						
Estevan Area (Lignite A)	No. of samples	18	18	15	15	15
	$\bar{x}$	14.36	0.67	0.22	0.06	0.41
	S	2.94	0.14	0.16	0.04	0.10
	S_x	0.69	0.03	0.04	0.01	0.03
ALBERTA						
Plains Region (Subbituminous C)						
Battle River Coalfield	No. of samples	14	14	14	14	14
	$\bar{x}$	8.91	0.55	0.04	0.01	0.50
	S	2.15	0.05	0.02	0.01	0.04
	S_x	0.57	0.01	0.01	0.005	0.01
Plains Region (Subbituminous C)	No. of samples	27	27	27	27	27
Sheerness, Battle River and	$\bar{x}$	11.75	0.53	0.09	0.01	0.44
Wabamun Coalfields	S	3.68	0.18	0.12	0.02	0.13
	S_x	0.71	0.03	0.02	0.005	0.025

$\bar{x}$ - mean value

S - standard deviation of the sample (unbiased)

S_x - standard error of the sample

* - Ash, total sulphur and sulphur forms are presented on a dry basis

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